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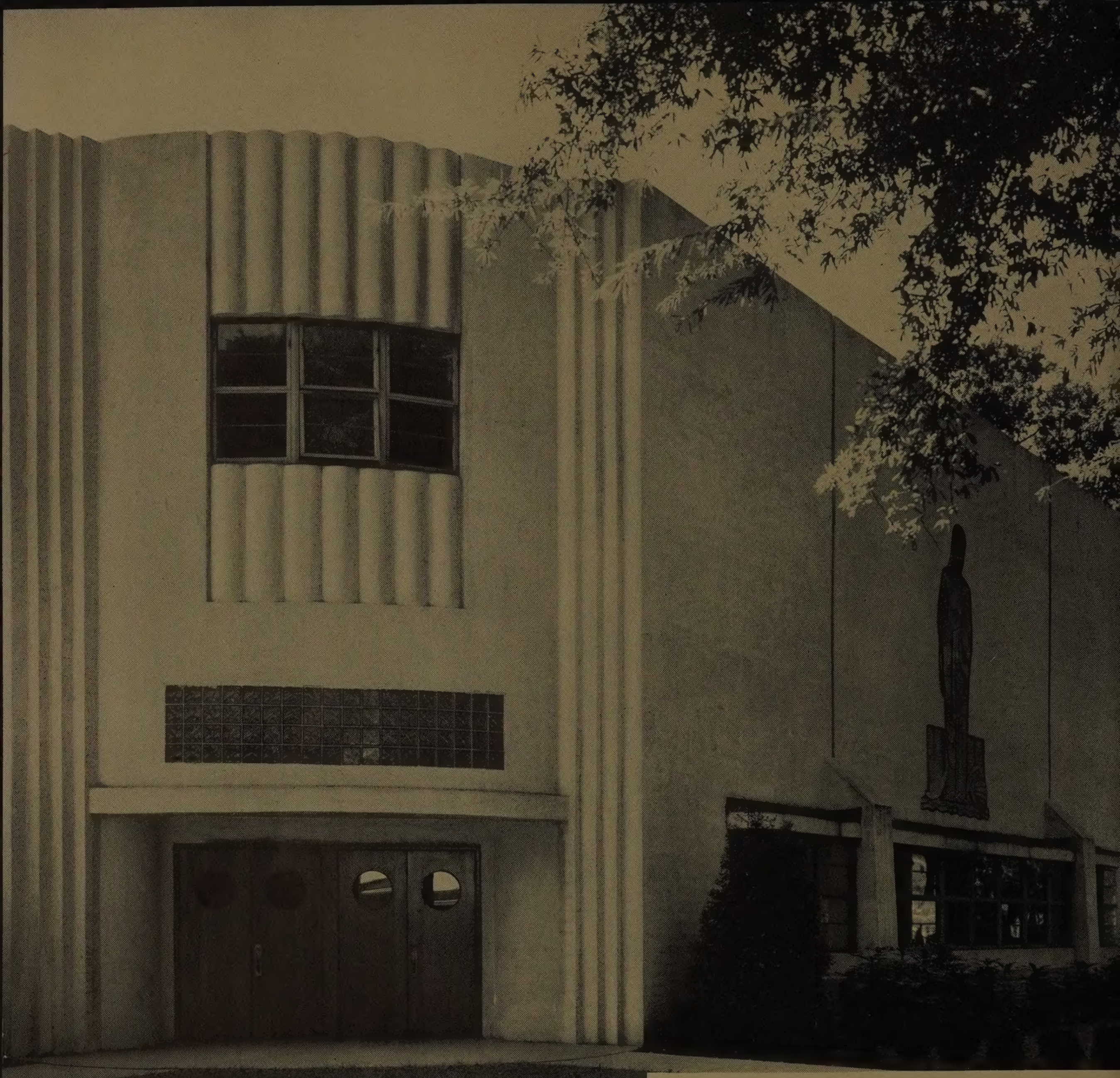
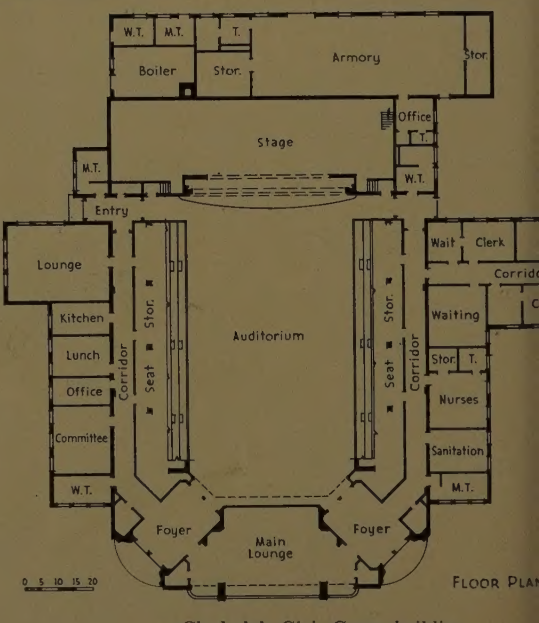


One of two main entrances to new architectural concrete civic center building at Clarksdale, Miss. (also see front cover). Contemporary in design, smooth-formed against large plywood panels, and with ornamentation limited to simple reeding and to one molded detail, the building houses a multiplicity of community functions, as the accompanying plan indicates. E. L. Malveny, of Jackson, was the architect.



Clarksdale Civic Center building.

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Architectural
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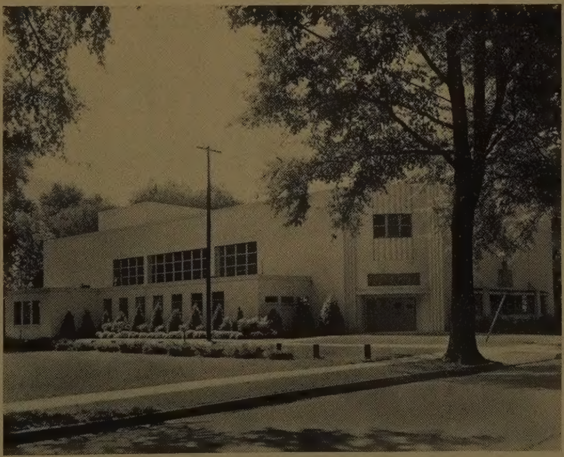
Civic Center and School
for Mississippi Counties

By E. L. Malveny*, AIA

XTENSION of education to every community and the right of public assembly have been cardinal American nciples since the founding of this country. In good times d in bad nothing has been permitted to halt progress in plementing those principles by providing suitable facil- es where youth may be taught and where all ages may et for discussion in public um, for recreation and for cultural enrichment of community. So it was in eping with American tra- ions that the city of Clarks- le and Coahoma County, iss., joined hands to build Civic Center in Clarks- le and the sister county of arren, farther south on the ississippi River, erected modern Redwood Con- idated School to serve one its rural districts.

Clarksdale's Civic Center built around the nucleus its auditorium where is held the big event of the year, the annual Cotton Carnival, a most important occasion in a land where cotton is king. But important as the carnival is, it represents but a small part of the activities housed within the civic center. The place teems with activity every day and at all hours. In addition to public and semipublic gatherings of all kinds, the state and county operate a health department in the building. There are laboratories and offices, rooms for dentistry and clinics, nurses' station and waiting rooms.

On the east side of the building are a well-equipped kitchen, lunchroom and lounge for small groups, and a committee room. These quarters are used by the various civic and other organizations of the town and county. The large main lounge is between and opens off the foyers to the audito-



East wall of the civic center building. Two single-story structures flanking the large auditorium contain offices, clinics and waiting rooms. Auditorium has stage and balcony.

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*Jackson, Miss.

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rium so that moderate sized groups not requiring the auditorium for their meetings may still use the main entrances to the building.

Behind the stage there are machinery, maintenance and boiler rooms; also facilities for the national guard. The second floor consists of a large horseshoe shaped reinforced concrete balcony under which the seats from the auditorium floor may be stored when not required.

In keeping with the spirit of the community and the purposes of the civic center, it was designed in conservative modern style for which architectural concrete is so well suited. Ornamental detail was confined to the intaglio figure on the north wall, the stepped reveals flanking the entrances and the wide reeding over the doorways. The intaglio figure was formed with a plaster waste mold and, left just as it came from the mold except for cleaning, the color is in pleasing contrast with the light color of the rubbed concrete walls.

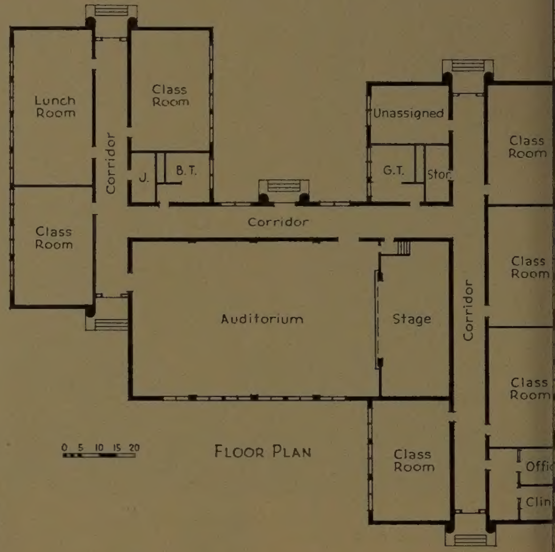
The Redwood Consolidated School in Warren County is a modern answer to a long felt need in that rural community. It is designed to impress the younger generation of its high purpose by simple dignity without being forbiddingly austere. Though devoid of anything which might be called ornamentation and depending entirely upon its lines and proportions of masses, it is felt that pleasing appearance has been achieved. Architectural concrete seemed to be the logical choice for this building as it was for the building in Clarksdale in order to insure sound construction, yet keep within the county budget from the sta
point of low first cost and low maintenance.

The building consists of six classrooms, a small clini
lunchroom and an auditorium which is adequate in
for school assemblies and small community gatherings.

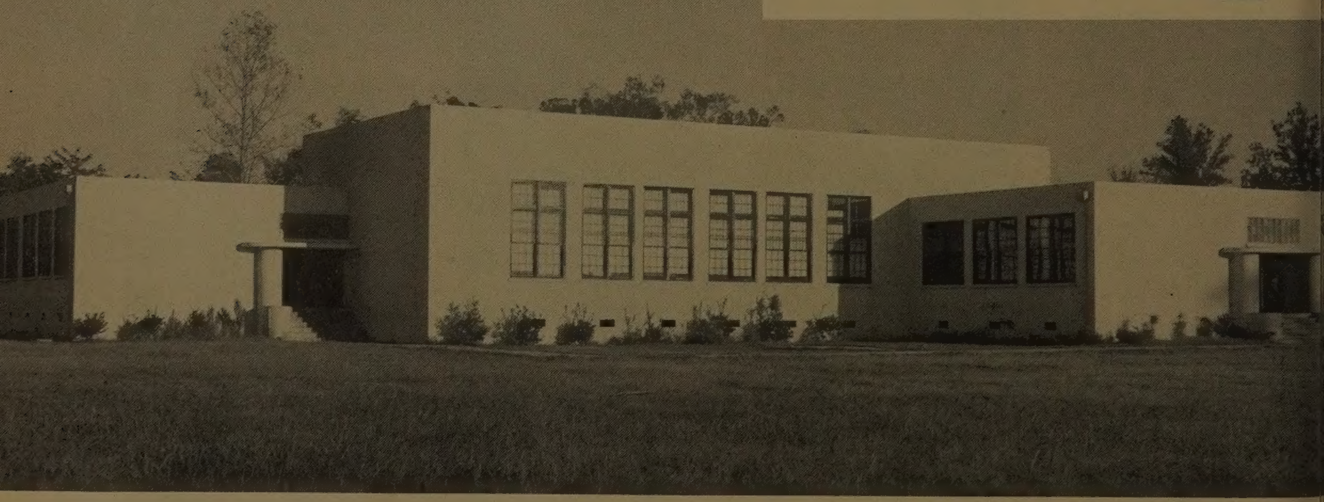
Plywood forms were used for the exterior walls wh
were given a light rubbing with carborundum bricks
remove small fins. Interior partitions are also cast-in-pl
concrete left exposed and simply painted. The auditori
floor is wood placed over a concrete base, while the ot
floors throughout the building are asphalt tile over concr

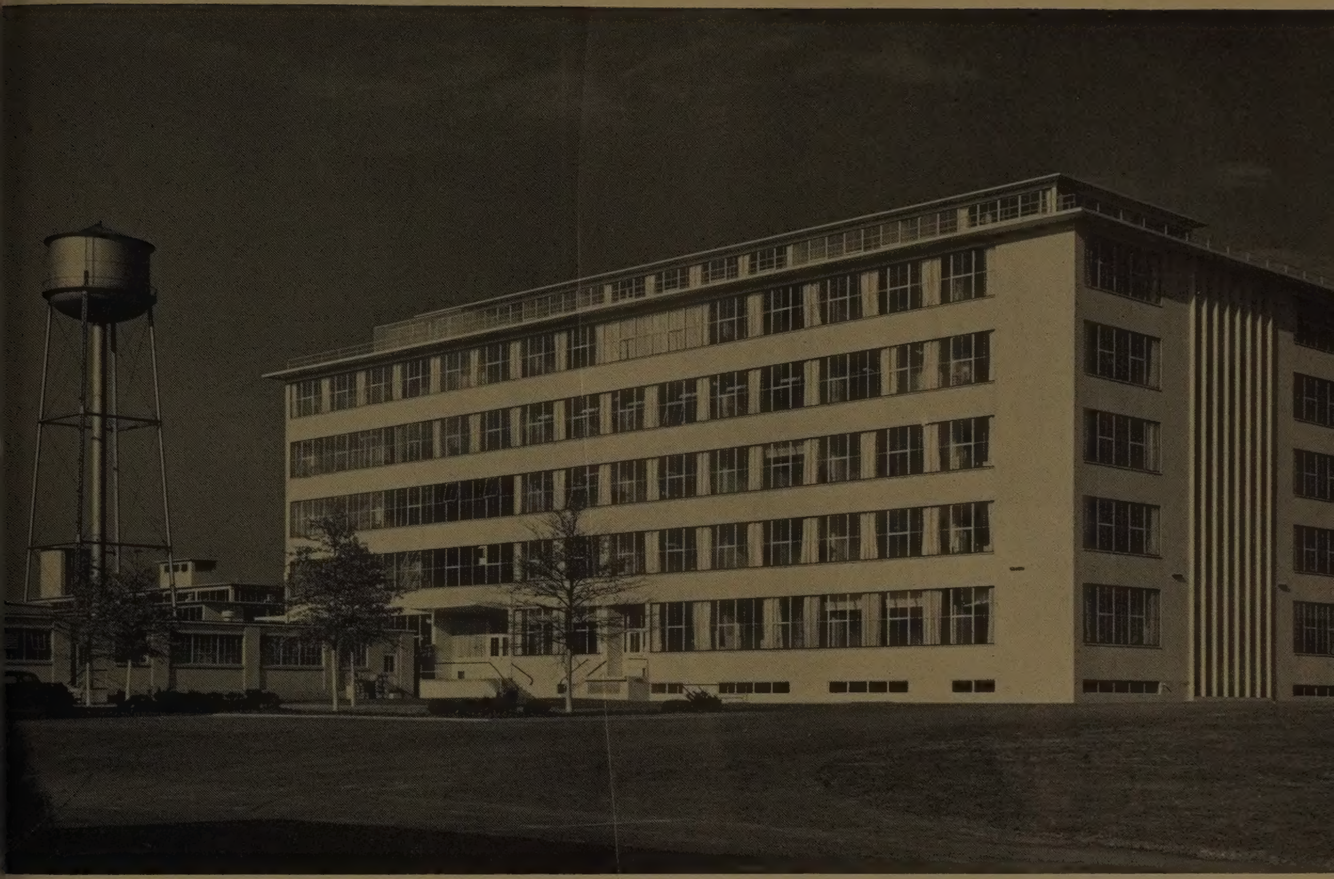
A local problem, which architectural concrete constr
tion answers particularly well, is the seasonal tornado.
the time the school was about two-thirds completed
severe tornado swept through the community, complet
demolishing nearby structures, but the only damage to
school was a few broken window sashes that were not co
pletely installed. In the future the school will be a pl
of refuge whenever the tornado warnings are broadc

Redwood Consolidated School, Warren County, Miss.



Another modern, streamlined structure of concrete designed by E. L. Malveny is Redwood Consolidated School in Warren County, Miss. A single-story building, it contains six classrooms, small auditorium and school lunch facilities. Located in a tornado belt (the surrounding area was partially devastated during construction) the building is used as a public refuge when storm warnings are given.





aximum natural illumination throughout the five floors of working areas was one of the design requirements for the new Hoffmann-LaRoche labo- ory at Nutley, N.J. Continuous bands of fenestration were made possible by moving columns back from the exterior wall and supporting large cast concrete wall units on cantilevered floors. Designed by Fellheimer & Wagner, New York architects, it was built by White Construction , also of New York.

esearch Laboratory
r Hoffmann-LaRoche, Inc.

By Steward Wagner*, FAIA

o industry seems to call for modern buildings in which to house its business more than does the pharma- tical industry and none of the many varied activities operations leading up to the final product literally

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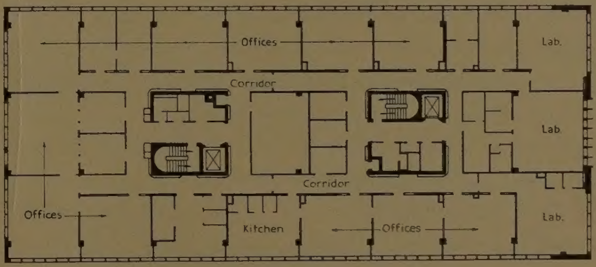
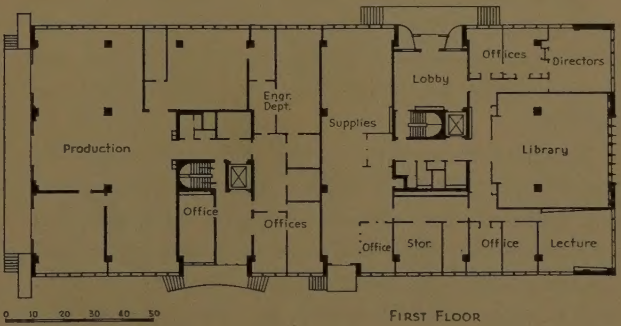
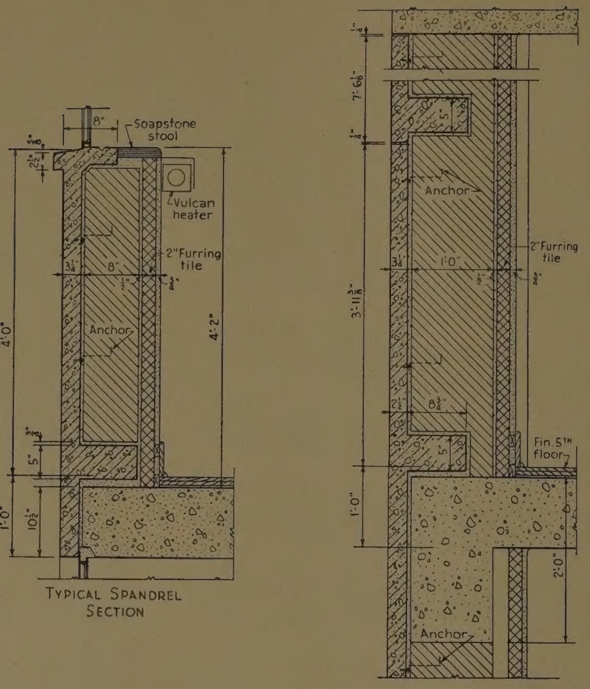
llheimer & Wagner, architects, New York, N. Y.



5TH FLOOR



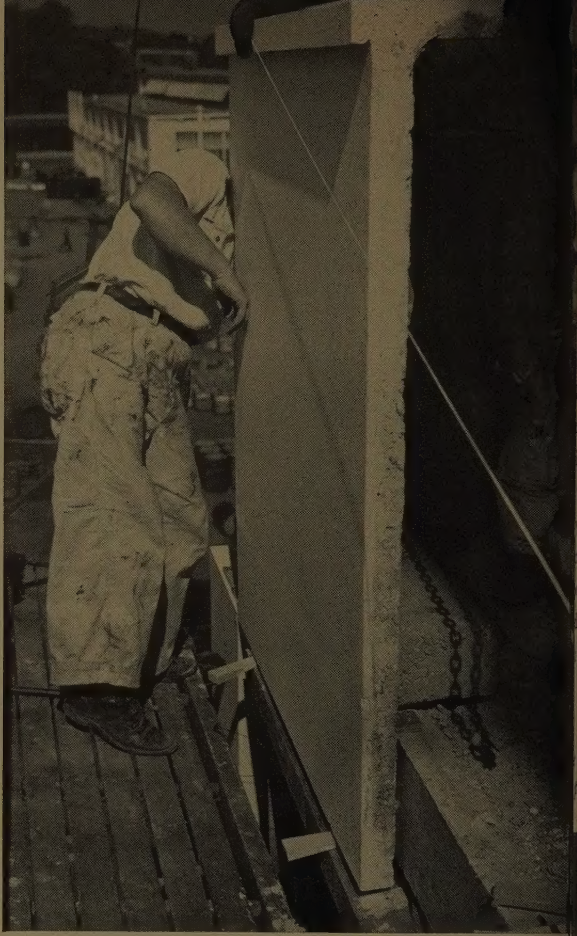
FIRST FLOOR



TYPICAL SPANDREL SECTION

TYPICAL WALL SECTION

Spandrel walls are precast units, with a facing of white portland cement and white quartz aggregate. Lugs cast on the backs of the units rest on the cantilevered floor slab. Wall units are backed up with masonry. Most slabs are 2½ in. thick.



demands the latest in everything associated with it as does the research laboratory. The very purpose of research is to explore new fields, to develop and create the things of tomorrow, to look into the future with vision and foresight. Such activities should be carried on amid the most modern surroundings in order that there be no subconscious fetters on the imagination nor limitations on the physical execution of whatever the mind may conceive.

The new Hoffmann-LaRoche Co. laboratory in Nutley, N.J., was accordingly designed to be modern in every sense of the word both inside and out. At this stage it should be noted that the term "modern" as used here does not in anyway connote the freakish or bizarre. On the contrary it means simple, clean-cut lines; it means devoid of the extraneous; it means utilitarian and functional; it means pleasing appearance through the studied use of mass and proportions and the predetermined play of light and sharp shadows.

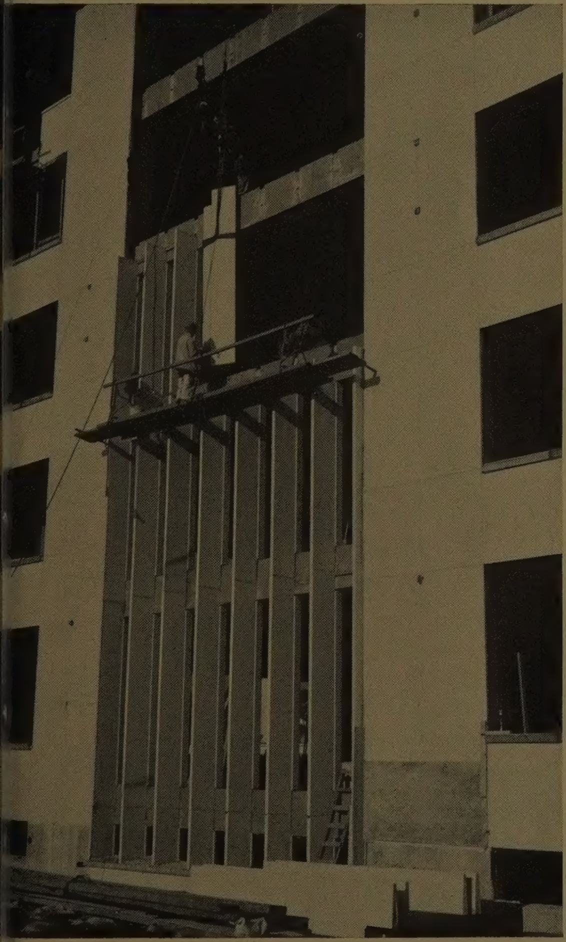
Not only is the architectural style of the building modern but the structural frame and the wall construction represent advanced ideas in design. Reinforced concrete flat slab construction long recognized by flared column capitals and drop panels has been associated with warehouses and industrial buildings where load-carrying efficiency was paramount and interference with partition arrangement w not a problem because few partitions were required in su buildings. The application of flat slab construction to building with the frequent partitions and varied arrang ment required in the Hoffmann-LaRoche laboratory repr sents an innovation made possible by the complete elimin tion of column capitals and drop panels, and by a mode building code which permits flat slabs to be designed continuous frames.

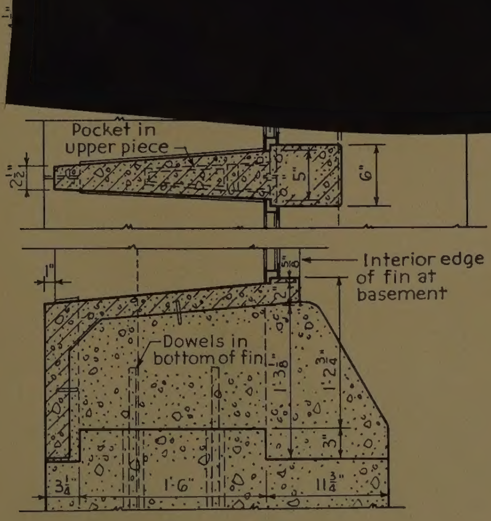
The function of the building called for the maximum natural light which dictated the use of continuous sash wi the minimum of interruptions in the form of piers or co umns. It was also desired that the windows should exte to the ceilings which precluded structural spandrel beam unless they could be upturned and upturned beams a sometimes a nuisance to build. These requirements we met by cantilevering the floor slabs 5 ft. beyond the fi interior row of columns. The exterior walls were carri on the edges of these projecting slabs so there are no co umns passing the windows which extend up to the flu ceiling, thus presenting no obstacles to the penetration light. The roof slab is likewise cantilevered off the first ro of columns a distance of 9 ft. or 4 ft. beyond the exteri walls.

he floors are designed throughout for a load of 300 p.s.f. ch is unusual for a building of the occupancy of this but this design load was used to provide for a future emplated change in manufacturing equipment result- in heavy concentrated loads. The interior bays are 25 6 ft. and are regular in arrangement which could have mitted designing by arbitrary coefficients, but the canti- red slabs carrying the wall loads made it necessary to gn the structure as a continuous frame.

he architectural treatment of the building required sur- s in which joints, if any, should be relatively far apart. s requirement ruled out many materials commonly used wall construction. A material was desired which would a high light-reflective quality, which would be light olor and would require the minimum of maintenance. derate first cost was also essential. After considerable y it was decided that large architectural concrete pre- slabs with masonry backup best met the requirements

vertical fins which form the only definitely ornamental detail recast units anchored to the structural spandrels by clip angles.





DETAIL OF FIN

in which [illegible] contrasted with the deep shadow lines of the vertical fins. The fin motif was borrowed from the company's parent building in Basel, Switzerland.

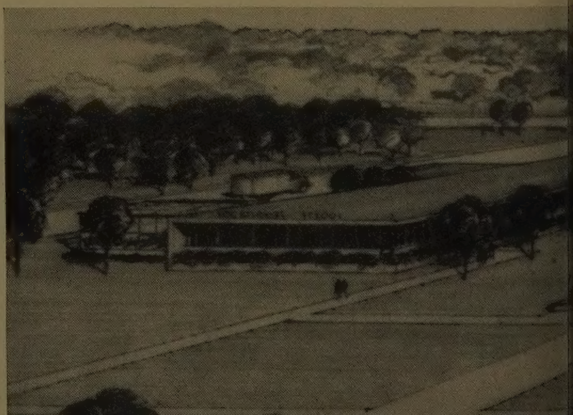
heads to window sills. Where there are no windows, as at the corners of the building, the precast slabs also have projecting lugs on the backs which rest on the floor slab and project into the backup for anchorage and bearing.

The floors and columns of the entire building were completed before the exterior walls were erected. Along the edges of the floors under the windows, 8x8-in. posts were cast 8 ft. center to center to give added rigidity to the spandrels. These posts are reinforced with four bars be up from the slab reinforcement. The posts extend from t floor to just beneath the sills and the facing slabs we made so as to provide a form for the posts. The slabs we set on the floors and held in position while the mason backup was laid. After all the backup was in place t joints between the facing slabs were pointed with a whi calking compound to match the slabs.

The fins, which form the central motif of the east wa are not an original idea in this building but were adapt from the Hoffmann-LaRoche office building in Bas Switzerland. It was apparent in the early studies that the fins with their long vertical lines were particularly w suited to the design of the building in Nutley. They seem to meet the requirement of "modern" architectural trea ment that there be a few well-planned and definite shadow The sharp lines of the fins cast straight vertical shadows contrast to the horizontal shadow made by the projecti roof slab, and the highlight bands on the edges of the fi or the area of shade, depending upon the positions of t sun and the observer, are in interesting contrast with t adjacent flat areas.

These fins are doweled into the basement wall at t bottom, and the top of each section is anchored by cl angles to the structural spandrels. A recess in the botto of each section fits over a lug in the top of the section belo The top-story pieces were erected by lowering them throu slots in the projecting roof slab so the entire fin assemb is very securely anchored from top to bottom to the stru tural frame.

Fellheimer & Wagner, architects, designed not only t building, but also the furniture and all equipment. T building was constructed by the White Construction C New York, general contractors, under the direction R. L. Bertin.



A Preview—new concrete projects
n the boards or abuilding

DURING the war hundreds of architectural concrete buildings, both public and private, ere designed for construction when restrictions n the use of materials and labor would be elaxed. In the last months of war, when victory as imminent, scores of these projects were taken ut of dusty drawers, polished up and refined. ome of them even got under way late in 1945 r early this year before new shortages created y loss of production and the housing emergency nce more froze all but the most essential building.

It would be too long to wait until many of ese buildings are completed before taking a ok at them, so the major portion of this issue is devoted to a preview of what the new concrete buildings will be like when visions are translated into material.

If the designs shown on the following pages are indicative—and they should be since they are selected from widely separated areas—concrete of the future will more and more assume the modern forms to which it is so well adapted architecturally, structurally and economically. In many of these projects will be seen ideas that were developed as wartime expediency, but which now have become accepted design practice.

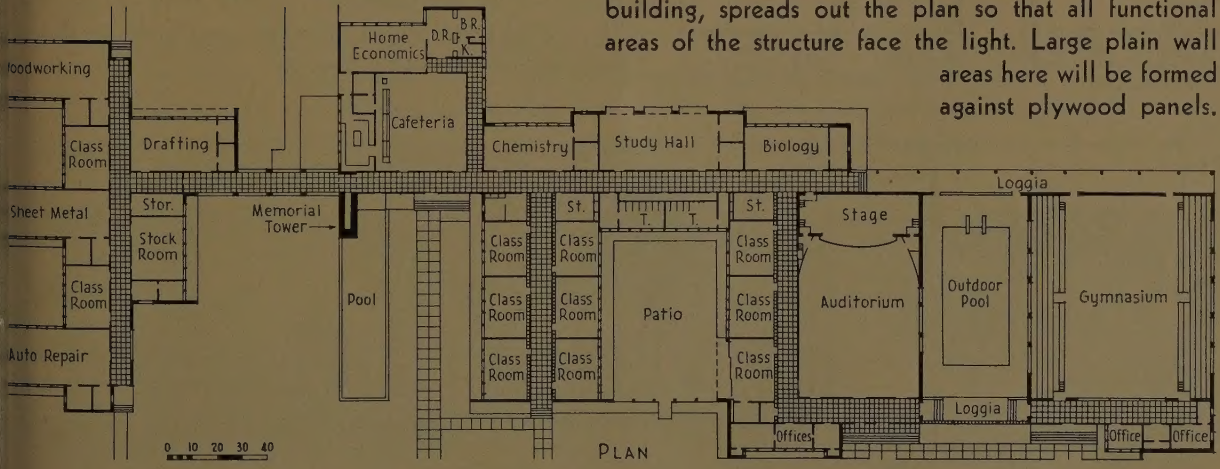
Some of these new buildings are under construction. Others are waiting for the green light.

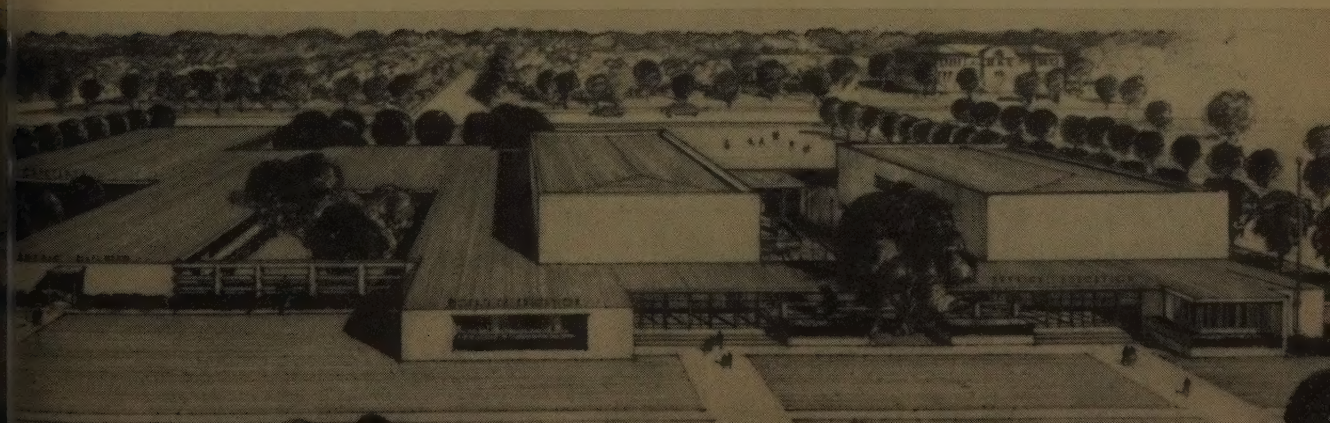
OCATIONAL TRAINING SCHOOL

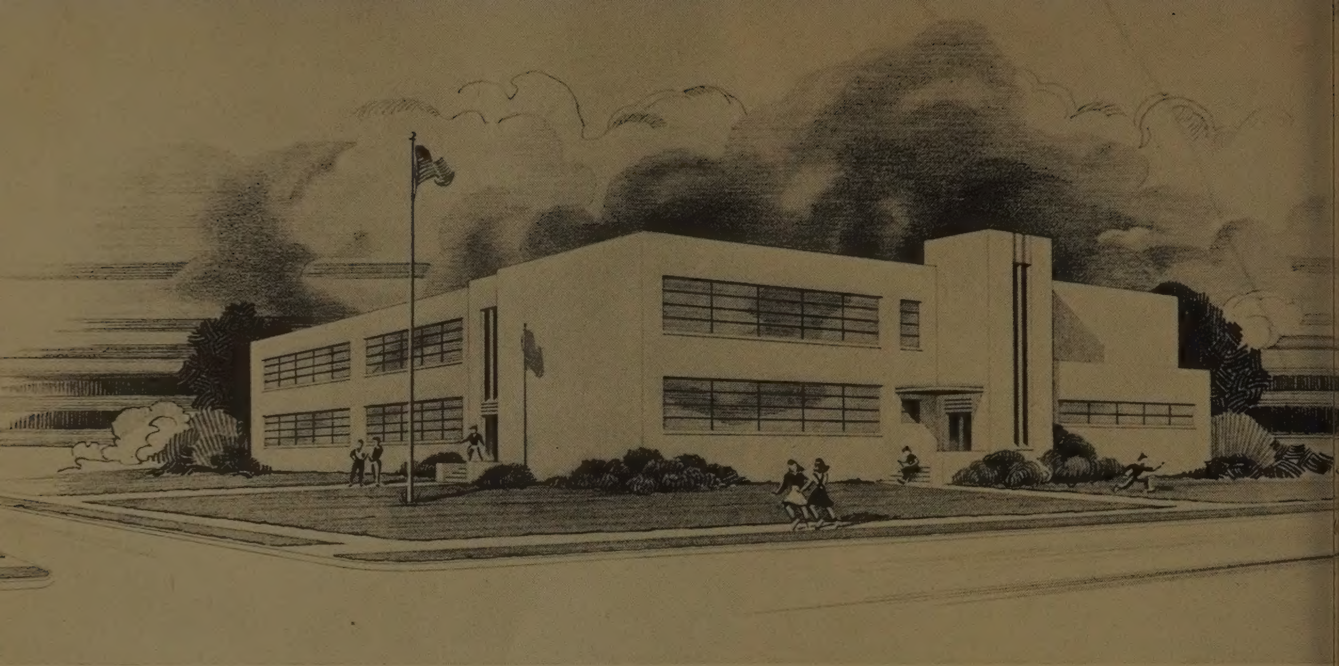
Picayune, Miss.

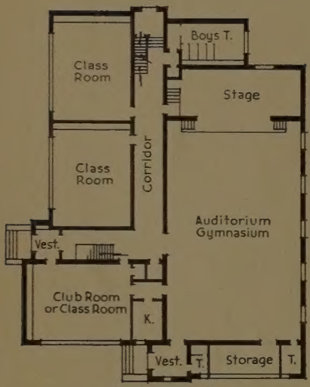
N. W. Overstreet, architect and engineer

An old, familiar and welcome sight to these pages is the work of N. W. Overstreet who, in this new school building, spreads out the plan so that all functional areas of the structure face the light. Large plain wall areas here will be formed against plywood panels.

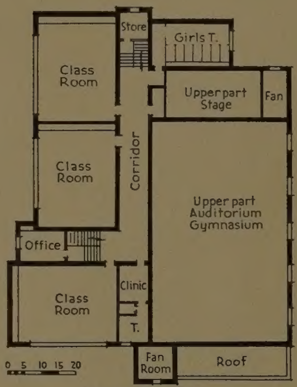








First Floor Plan



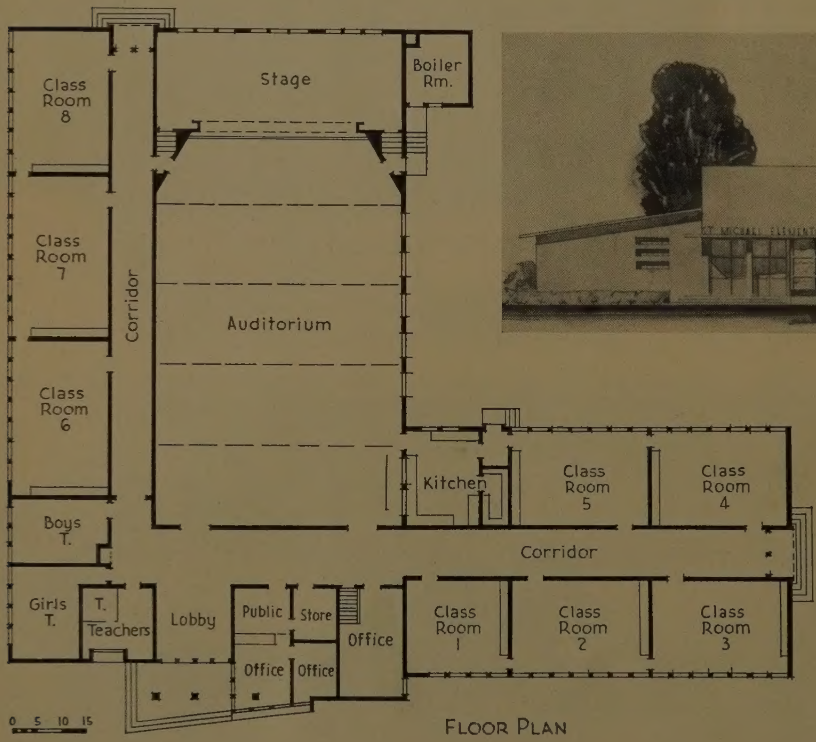
Second Floor Plan

GALLIPOLIS SCHOOL

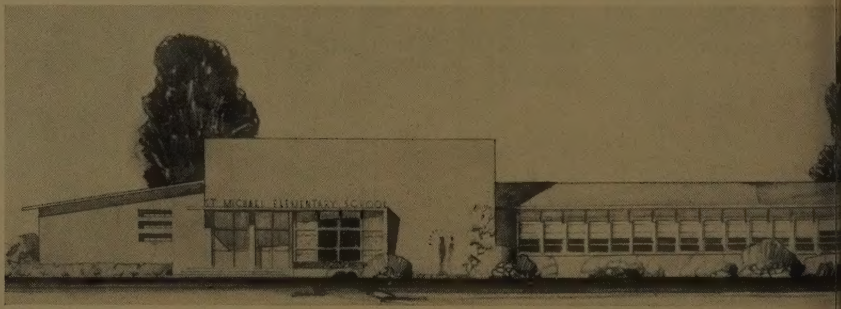
Gallipolis, Ohio

William J. Davis, architect

Large window areas and plain spandrel walls feature t small, modern school building in which the auditori serves also as gymnasium. The strong horizontal feeli produced by the unbroken window areas is relieved the central tower which serves as a vestibule on the m floor and as a fan room above.



Floor Plan

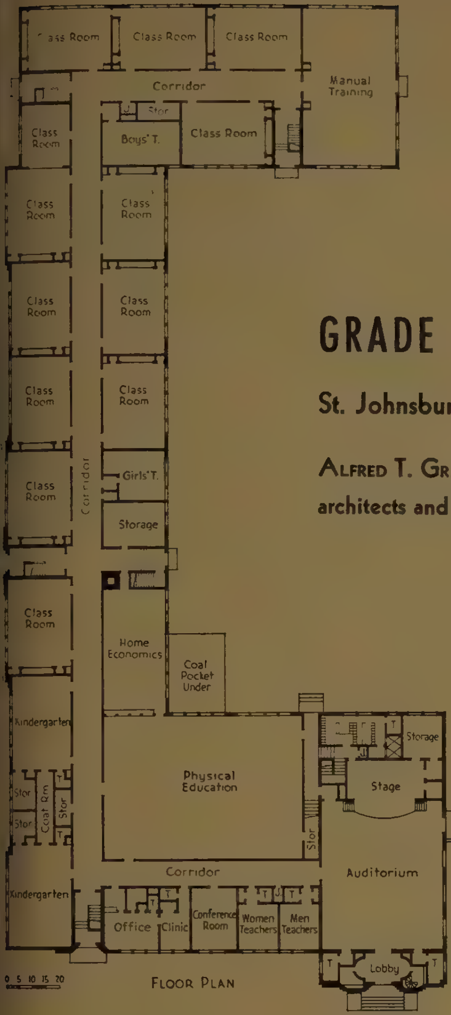


ST. MICHAEL ELEMENTARY S

Biloxi, Miss.

James T. Canizaro, architect

Designed as an educational and commun center for a group of fishermen's families, t building has low pitched roof over classro areas and wide overhanging eaves to prot them against the sun. Readers of ARCHIT TURAL CONCRETE are already acquainted w the work of this architect.



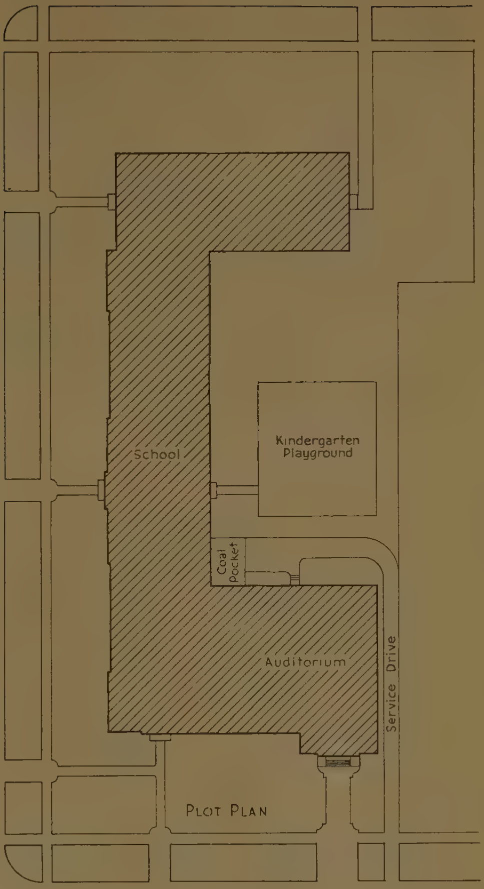
Floor Plan

GRADE SCHOOL

St. Johnsbury, Vt.

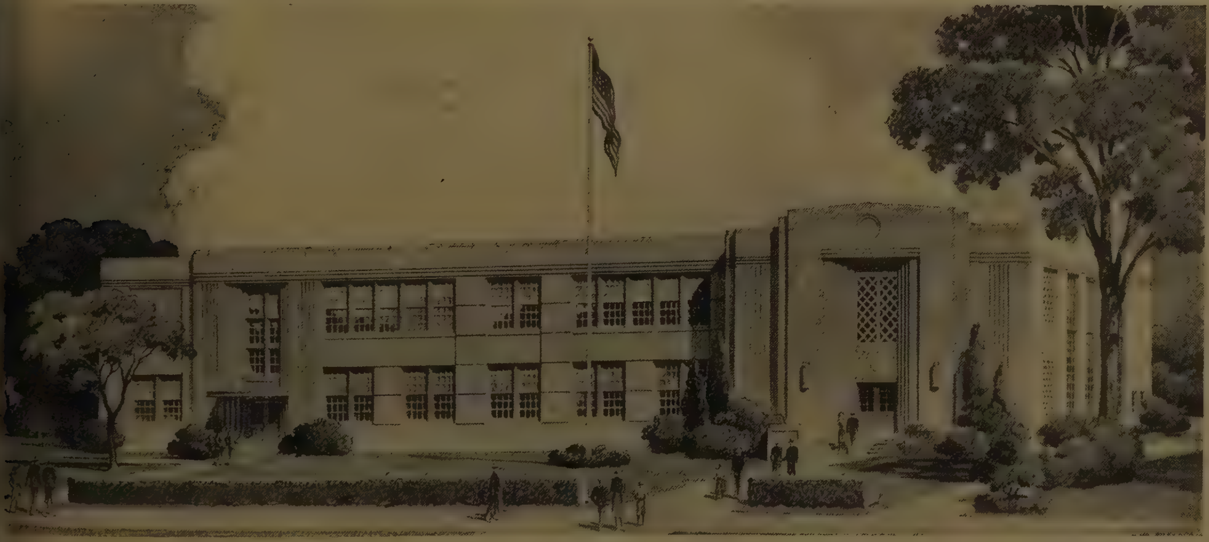
Alfred T. Granger Associates,
architects and engineers

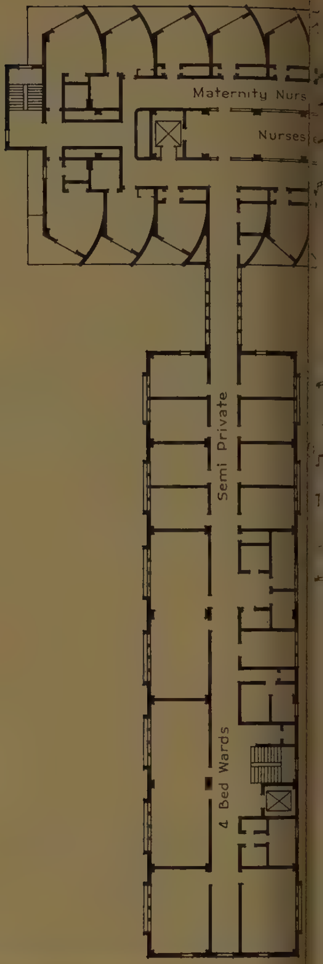
Rendering (below) shows only a portion of this quite large school building as indicated by plans.



Plot Plan

A few years ago a vocational school building was erected in architectural concrete in St. Johnsbury. The splendid results obtained in a climate that is admittedly rugged suggested concrete also be used for the new grade school. The same architects designed both structures. In design the new school conforms to the modified classic forms familiar in this New England community.





ONE HUNDRED FIFTY-BED HOSPITAL

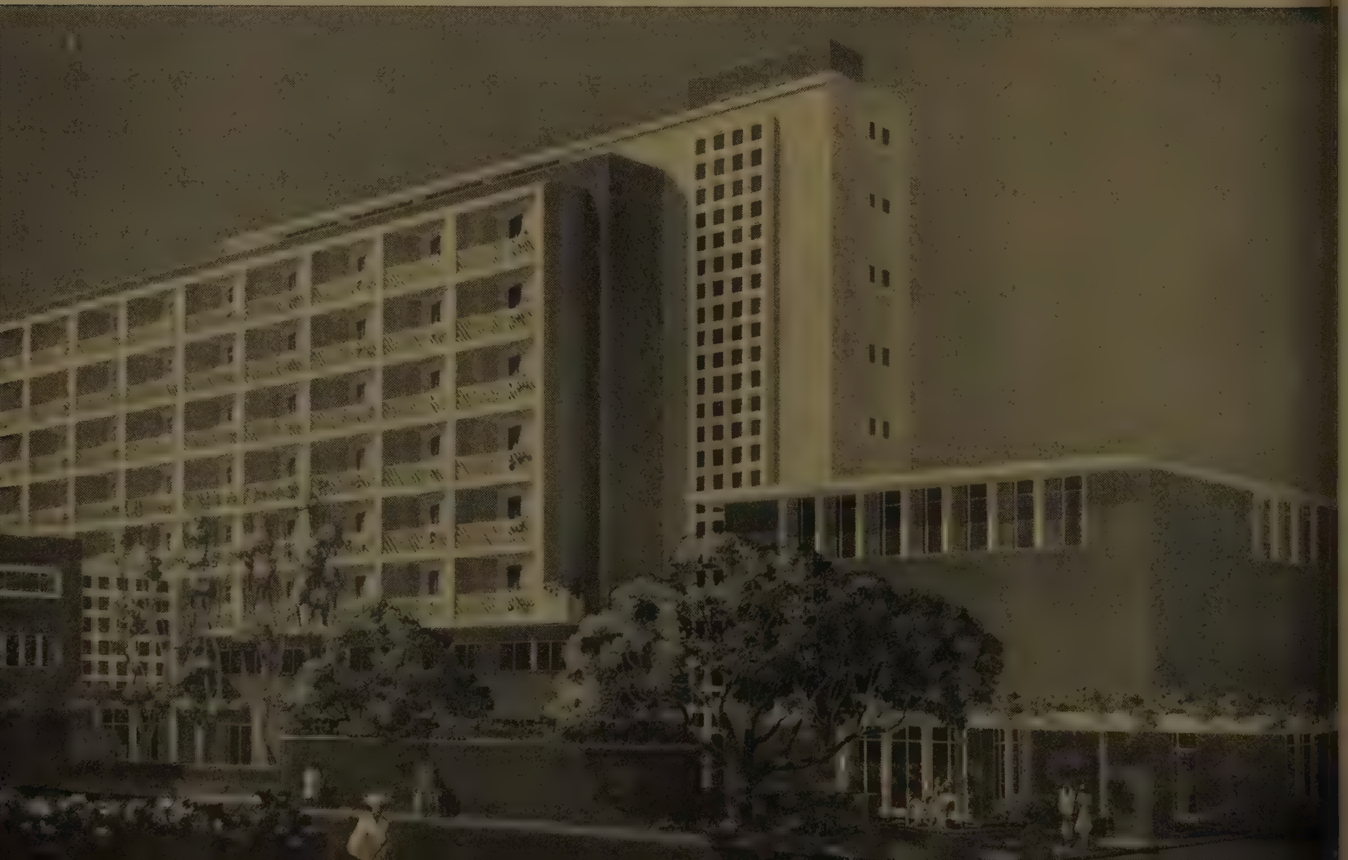
Beverly Hills, Calif.

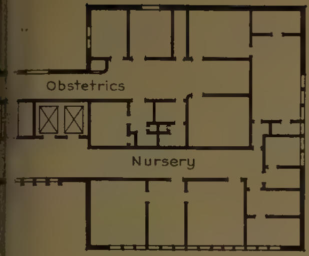
Douglas Honnald and George Vernon Russell,
associated architects

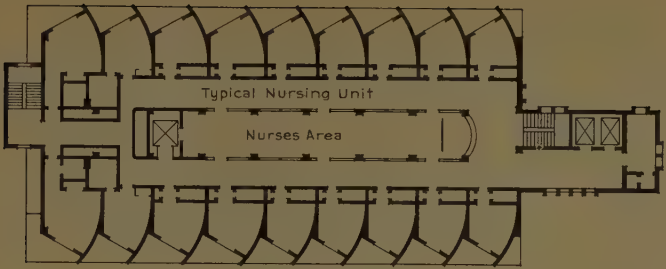
Concrete is no stranger to southern California, but its use in this design, which shows definite continental influence, is a very wide departure from the usual "California style". Boldly vertical, it is elevated on a staggered T-plan, using both sides of the high portion for banks of sun balconies (see third floor plan). Provisions are made in the plan for future expansion.

The structure, belonging to the Beverly Hills Hospital Association, will be located near Beverly Blvd. at Maple Drive.

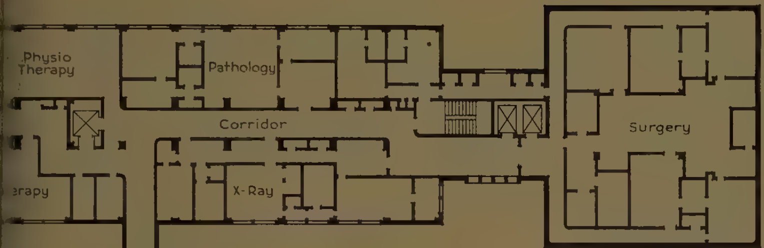
Cost of the building, which will be executed in architectural concrete as soon as conditions permit, is estimated at $1,500,000. The hospital association is composed of a group of doctors who demanded the best possible design for modern therapeutics.

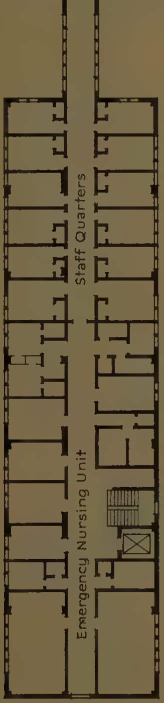




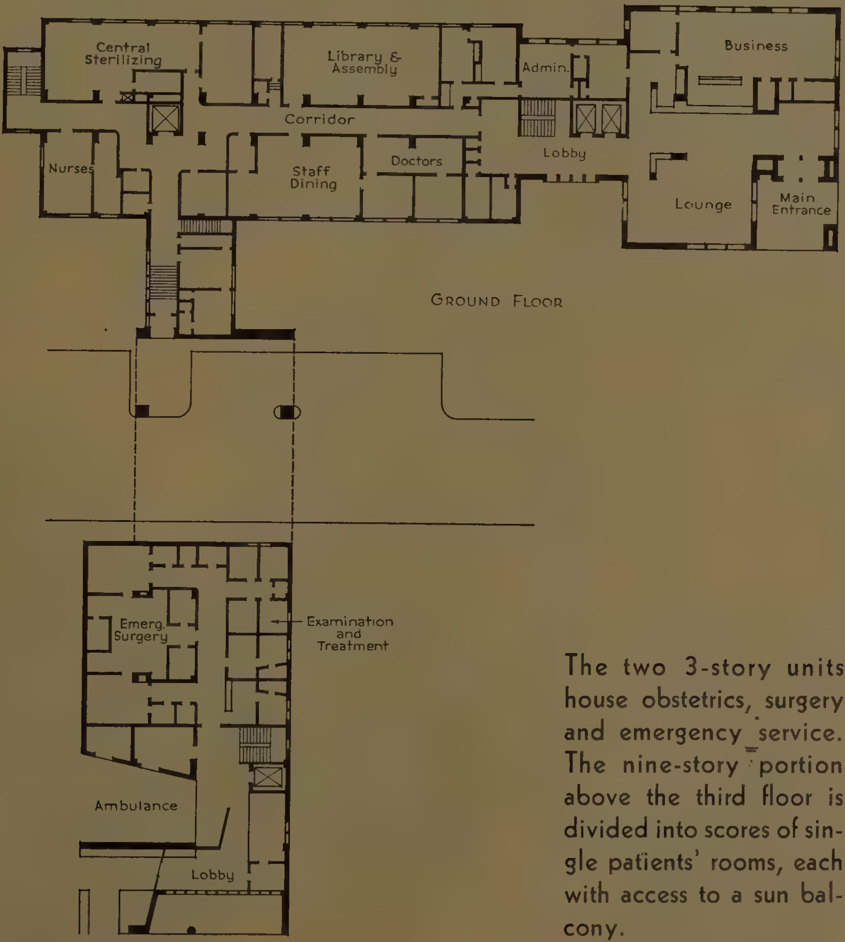


4TH, 5TH, 6TH, 7TH, & 8TH FLOORS





SECOND FLOOR



GROUND FLOOR

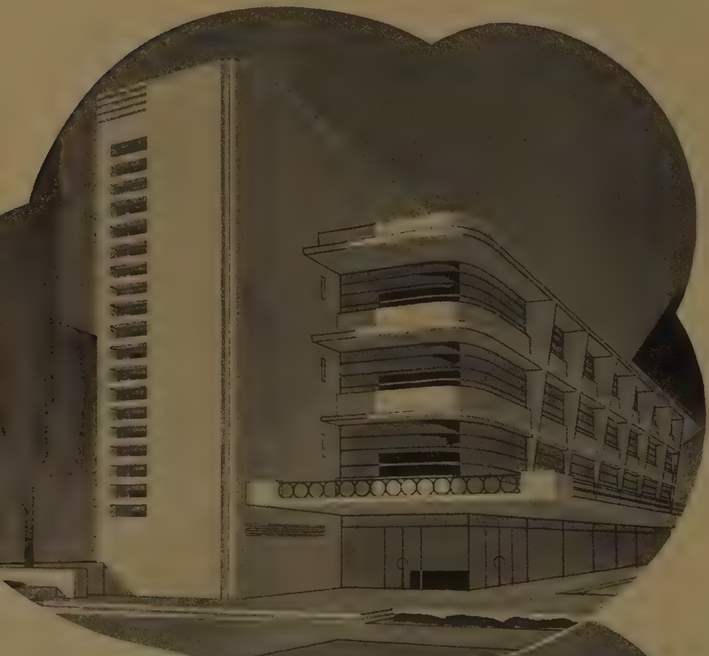
The two 3-story units house obstetrics, surgery and emergency service. The nine-story portion above the third floor is divided into scores of single patients' rooms, each with access to a sun balcony.

MEDICAL AND DENTAL CENTER

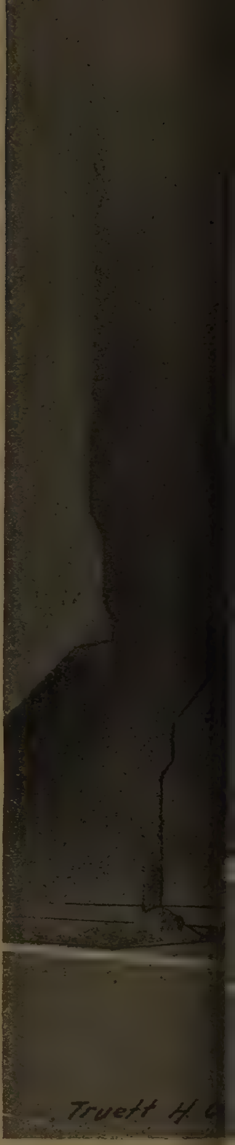
Oklahoma City, Okla.

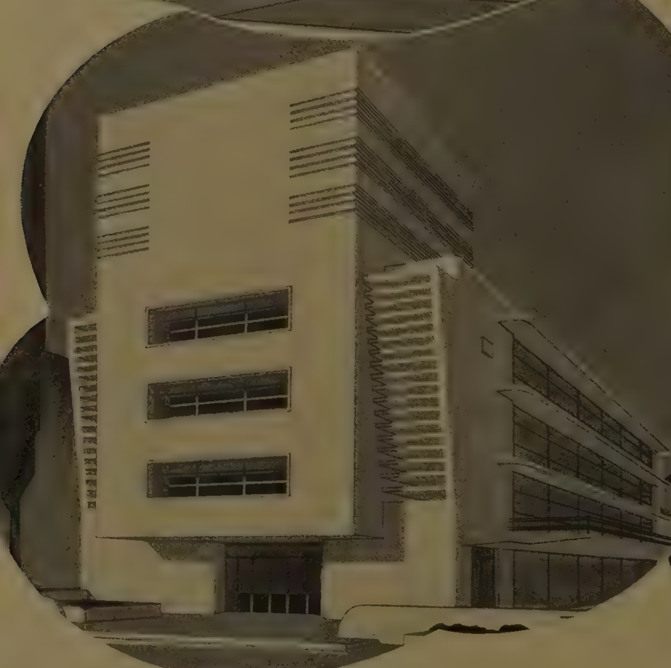
Coston and Frankfurt, architects and engineers

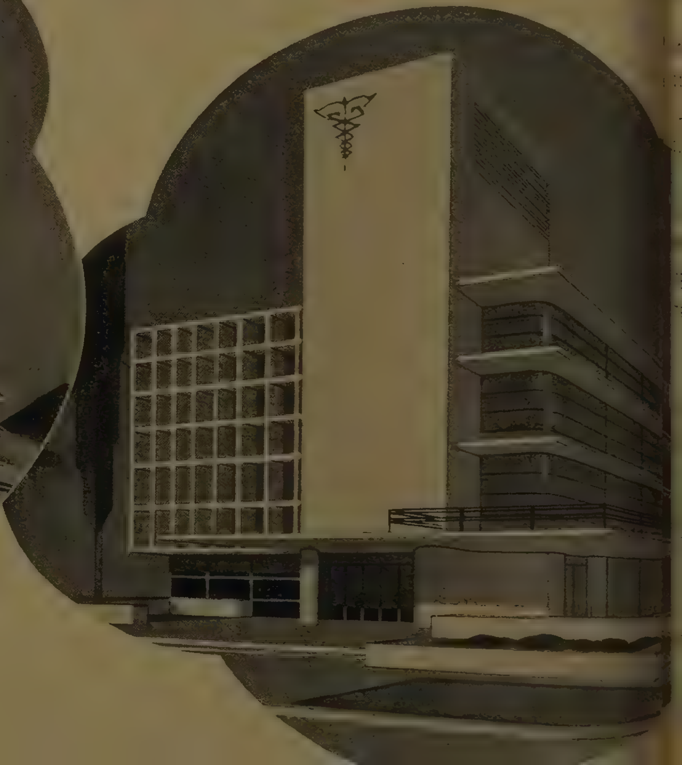
Planned to be the Southwest's most modern and complete building devoted exclusively to the medical and dental professions, the new center is to be located in Oklahoma City's hospital area. It will contain offices for medical professions only, each planned as roomy, well-lighted suites of various sizes. The building will be air-conditioned for both summer and winter use.

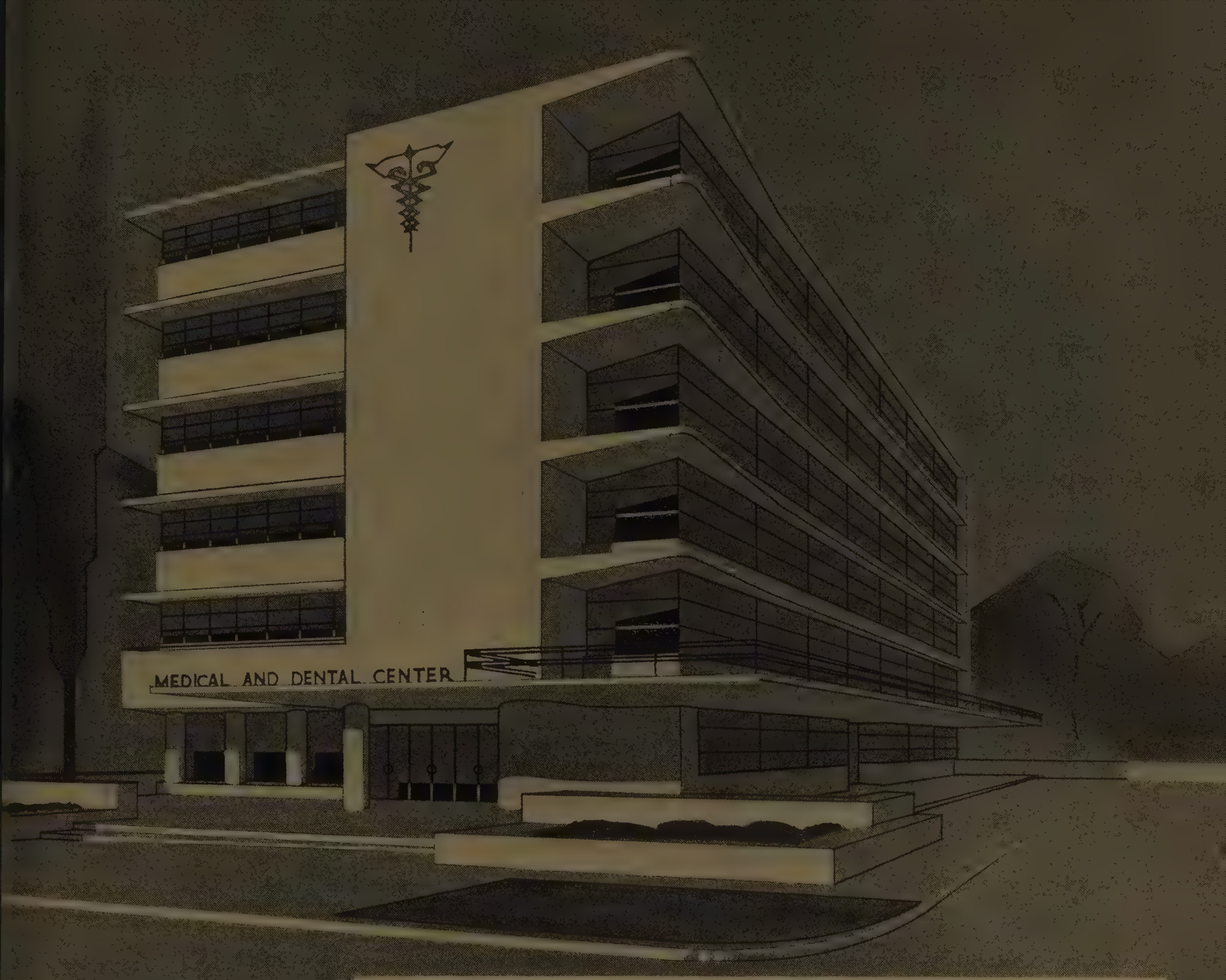


These three preliminary four-story studies of the problem finally resulted in the six-story solution shown at right. The evolution of the design to achieve greater useful space is quite evident. Concrete was selected for its adaptability to the modern design with its many cantilevered canopies, as well as its favorable cost factor.

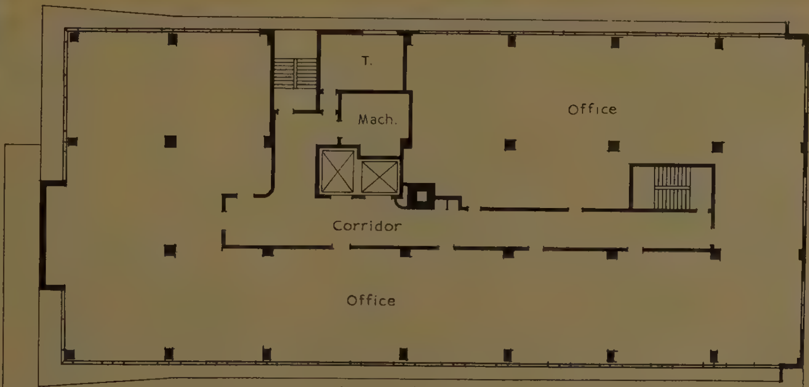




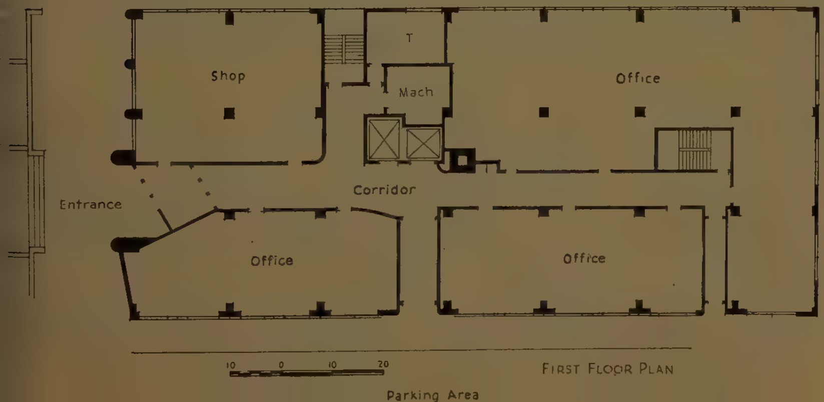




ain and typical floor plans indi-
e the spaciousness of offices and
unbroken light areas. Typical
ors are flexible in plan and inte-
r space freedom provides for
ctically any arrangement for
ices. The building has complete
ing facilities for use of all kinds
medical and dental equipment.



Typical Floor Plan



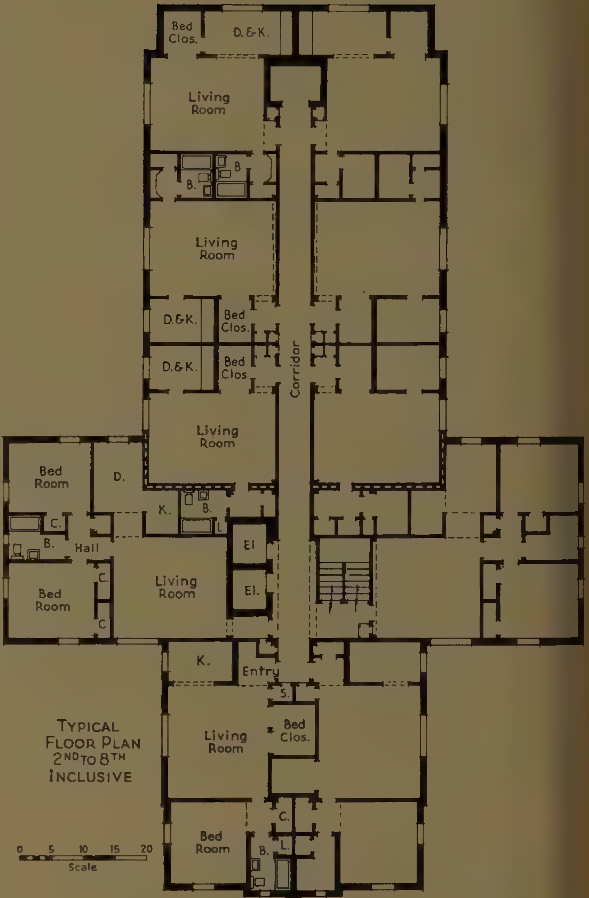
First Floor Plan

EVELYN TOWERS APARTMENT

Nashville, Tenn.

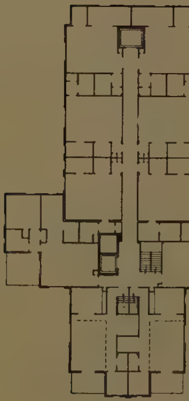
John H. Parmelee, architect

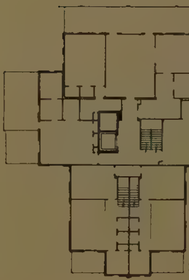
Recognizing that construction of well-designed and soundly built apartment buildings of architectural concrete offers an economical way to provide adequate housing facilities quickly, particularly at this time when they are so desperately needed, John H. Parmelee was commissioned by Robert M. Condra to design the new Evelyn Towers Apartment in Nashville. Quietness and privacy due to concrete floors and walls, firesafety and continued excellent appearance at very little maintenance cost have all become strong reasons for building modern hotels and apartments in architectural concrete. Evelyn Towers will be 12 stories high, containing 100 dwelling units. Interior space will be unencumbered by large columns since the weight of the building will be carried by the walls.

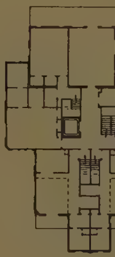


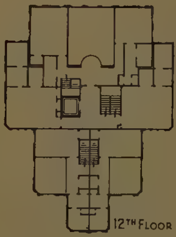
TYPICAL FLOOR PLAN
2ND TO 8TH
INCLUSIVE

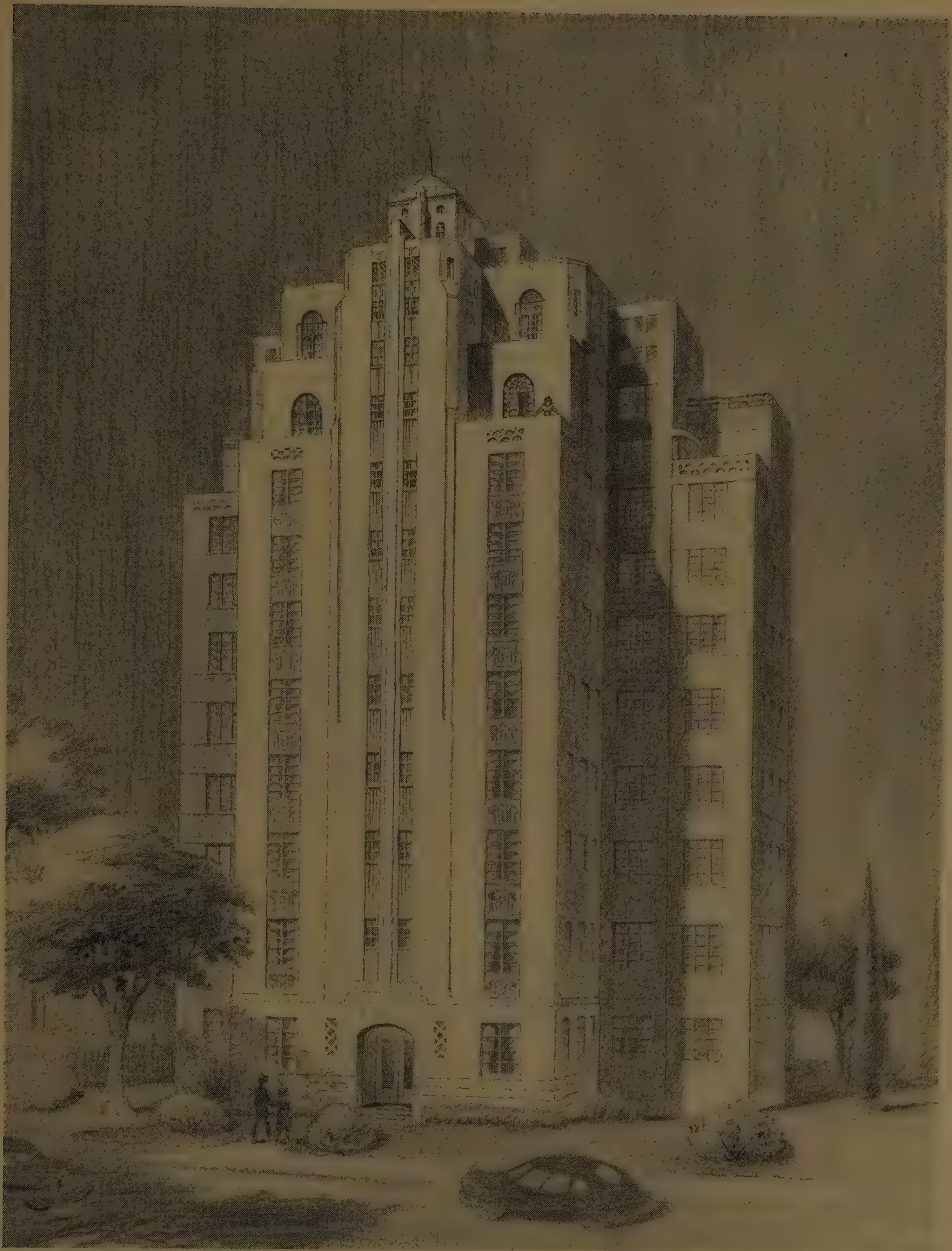
Below are shown upper story variations in floor plan to provide a group of penthouses for really gracious living.


9TH FLOOR

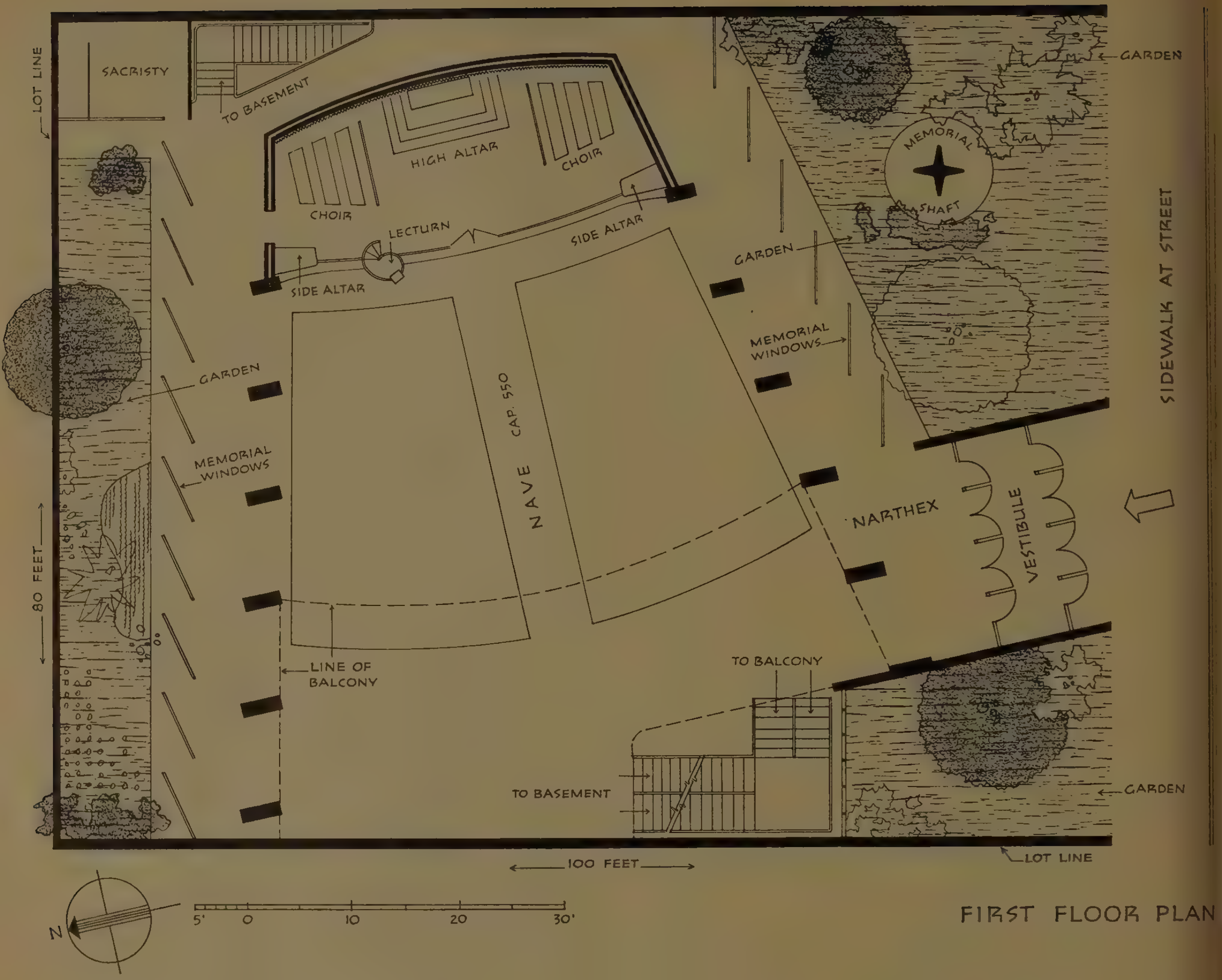

10TH FLOOR


11TH FLOOR


12TH FLOOR



ilding site for Evelyn Towers is a high knoll just outside of business area. Penthouses ll be above the highest buildings in the city. The building itself will be set back from street so it was not necessary to cramp the design with the usual setbacks required en buildings crowd Nashville lot lines.



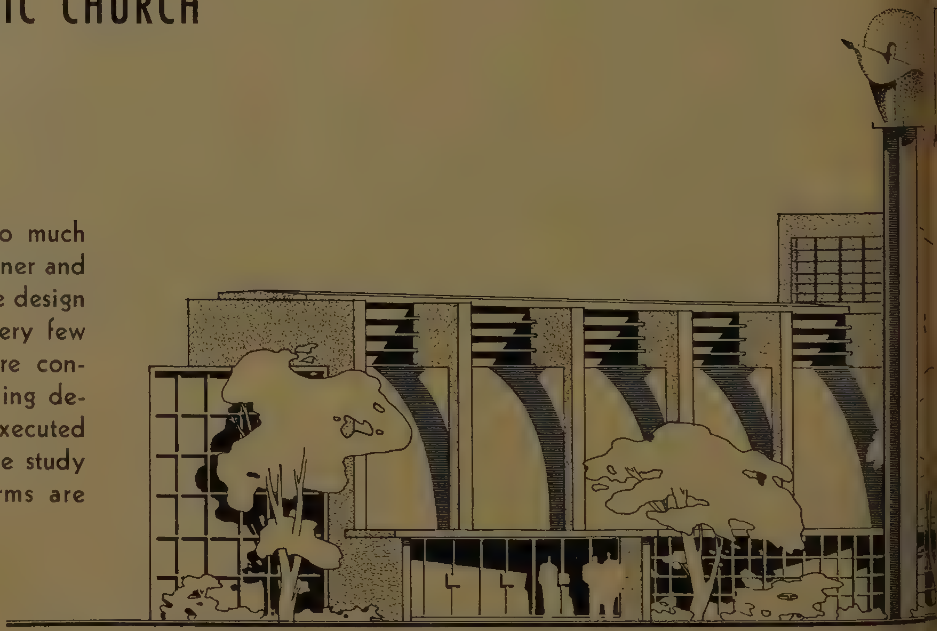
FIRST FLOOR PLAN

LIBERAL CATHOLIC CHURCH

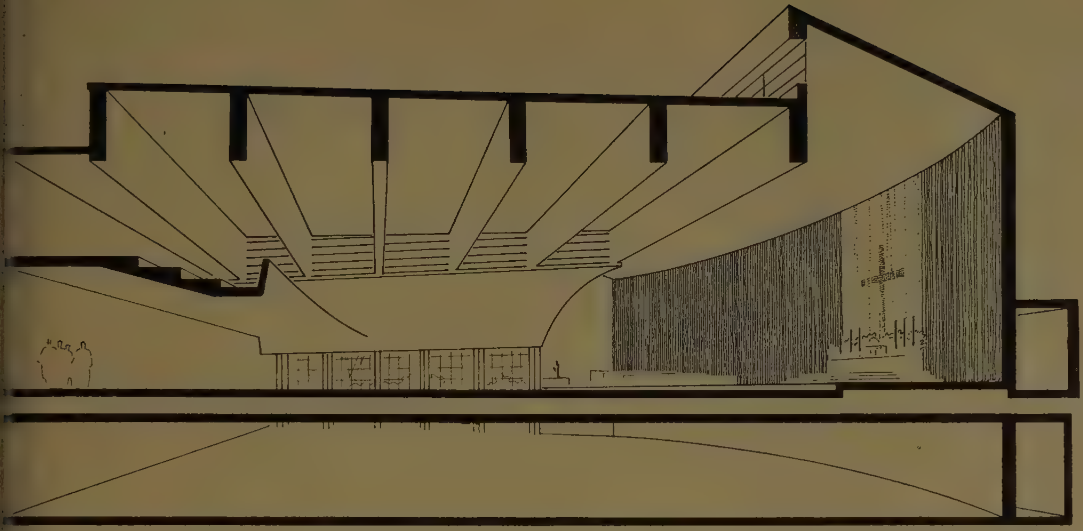
New York, N. Y.

Jedd Reisner and Associates,
architects

Few architects have had so much freedom as have Jedd Reisner and his associates in creating the design for this modern church. Very few ecclesiastical traditions were consulted to achieve this thrilling design, which is to be boldly executed in concrete, but upon close study many familiar church forms are evident.

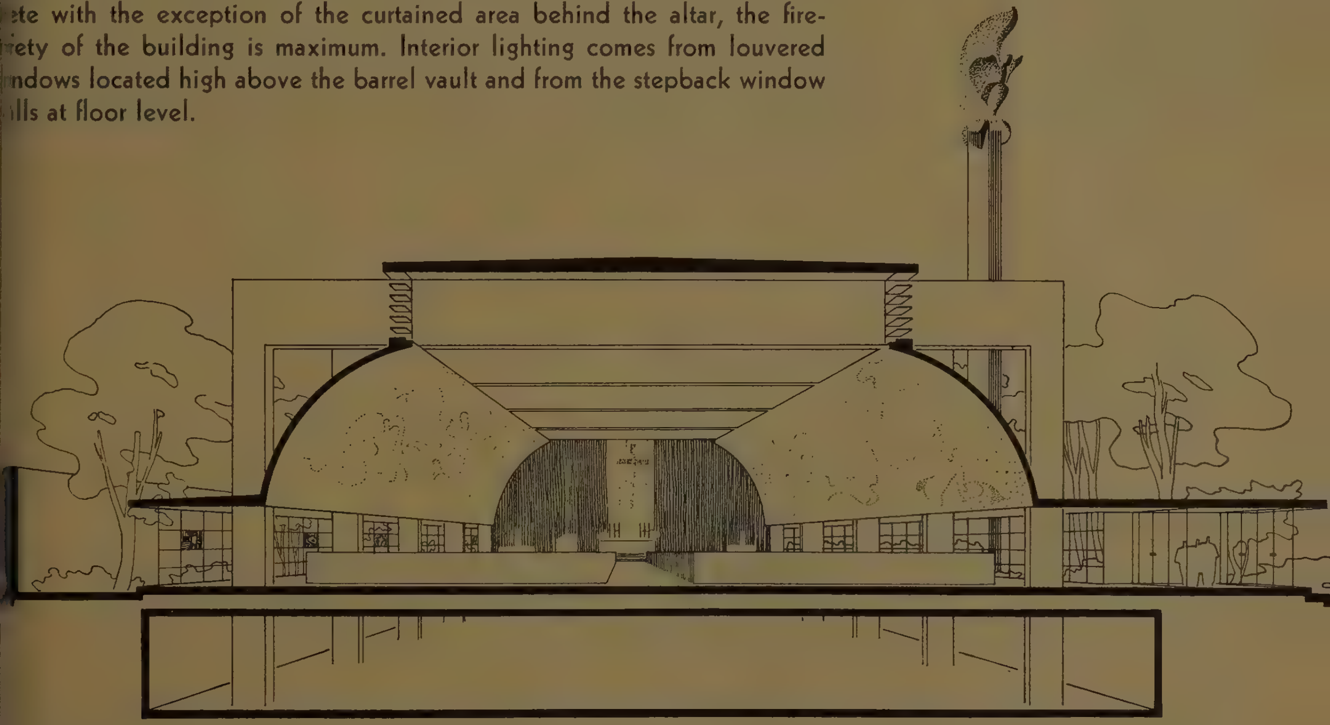


STREET ELEVATION



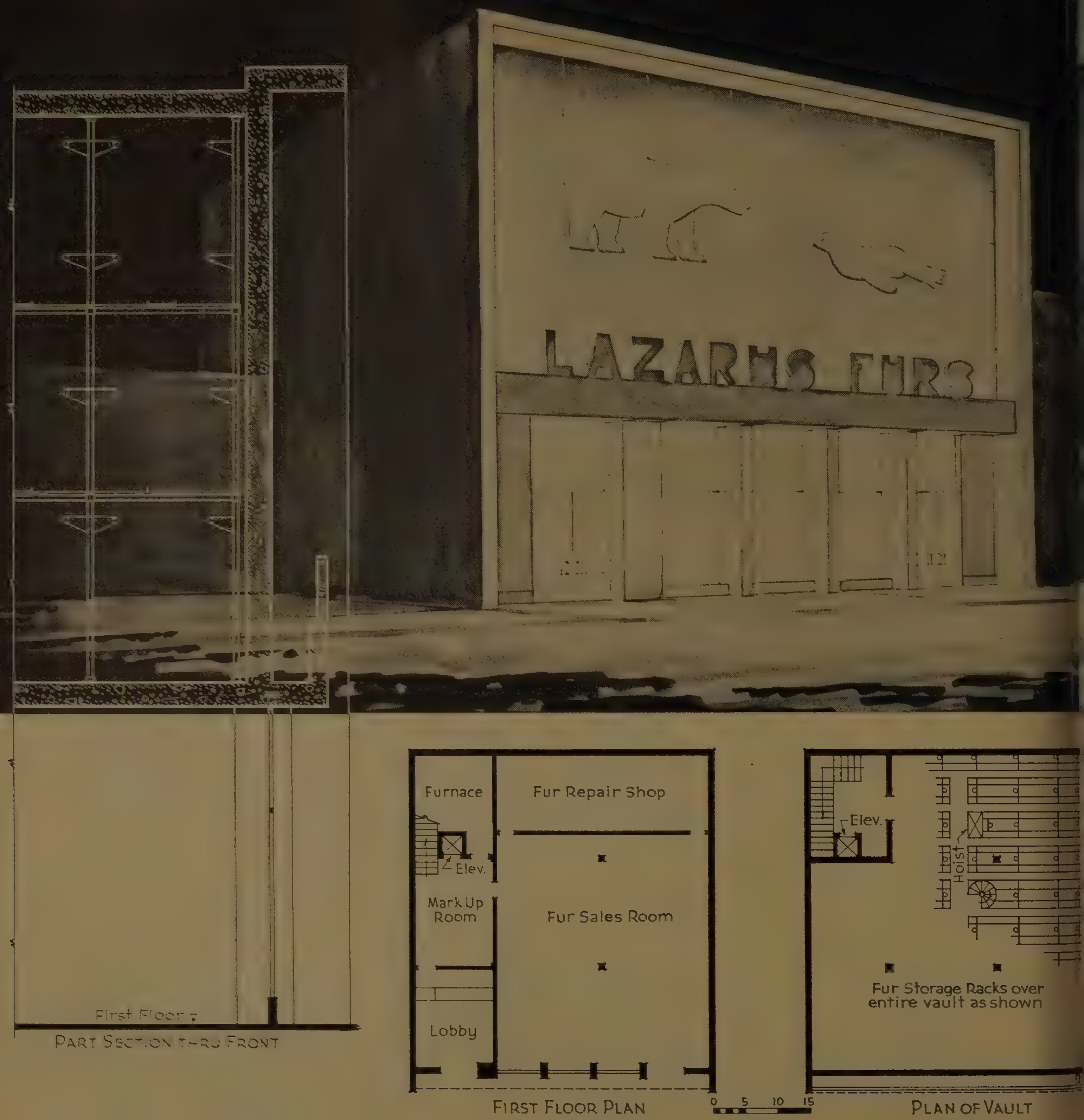
LONGITUDINAL SECTION

e reinforced concrete rigid frames which are the main structural features
e reminiscent of flying buttresses. With all interior surfaces exposed con-
ete with the exception of the curtained area behind the altar, the fire-
ety of the building is maximum. Interior lighting comes from louvered
ndows located high above the barrel vault and from the stepback window
lls at floor level.



CROSS SECTION

Although the interior enrichment is due mainly to the form and movement of structural elements, the barrel vault which is both wall and ceiling will be appropriately decorated by cast-in-place molded detail. Large wall areas will be formed against matched boards of various widths while members of the structural frames will be smooth-formed against plywood for contrast.



PART SECTION THRU FRONT

FIRST FLOOR PLAN

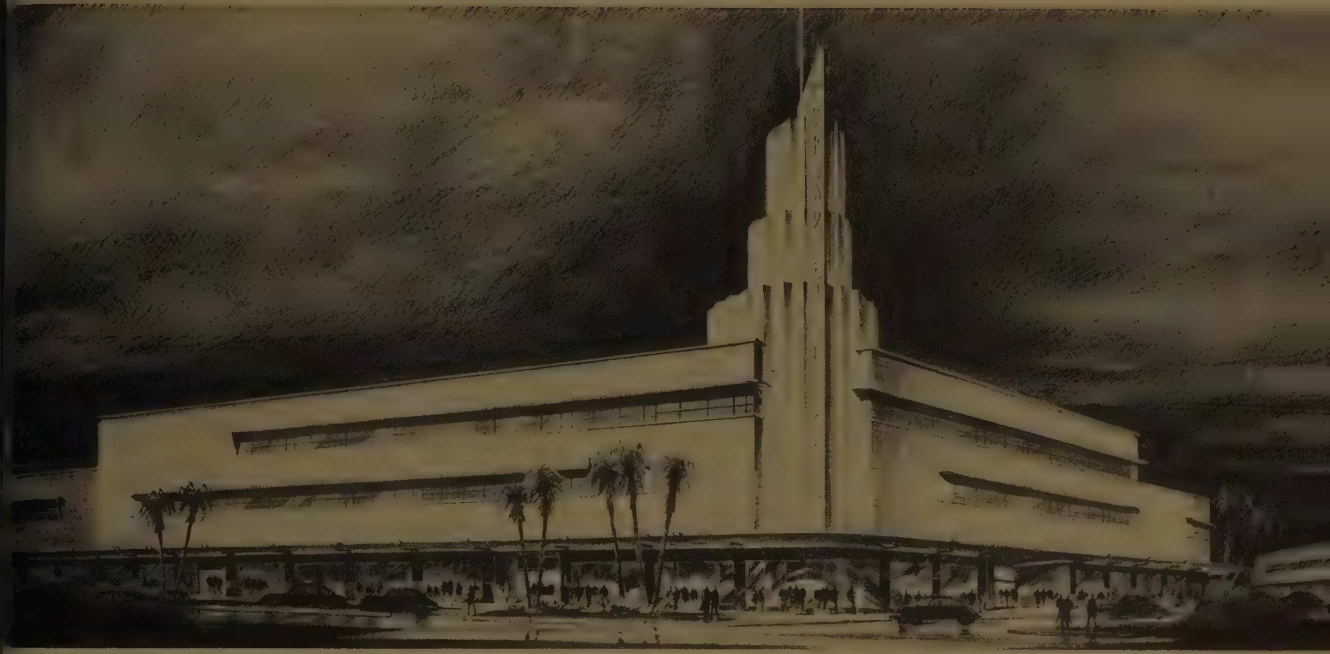
PLAN OF VAULT

FUR STORAGE BUILDING — LAZARUS, INC.

Cumberland, Md.

S. Russ Minter, architect

This commercial building combines sales, repair and storage areas in a compact, efficient plan. Letters on the front will be cast as part of the cantilevered extension of the second floor. The fur storage areas are lightproof and completely air-conditioned.

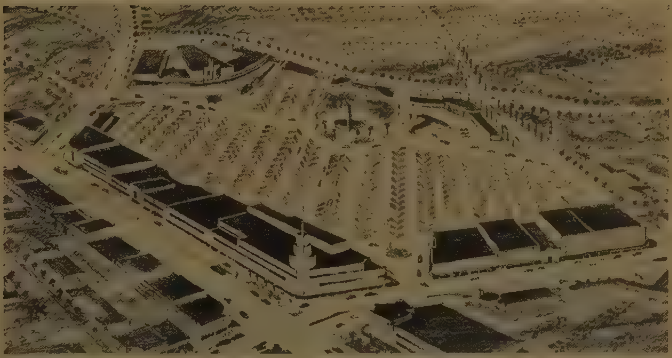


ROADWAY DEPARTMENT STORE

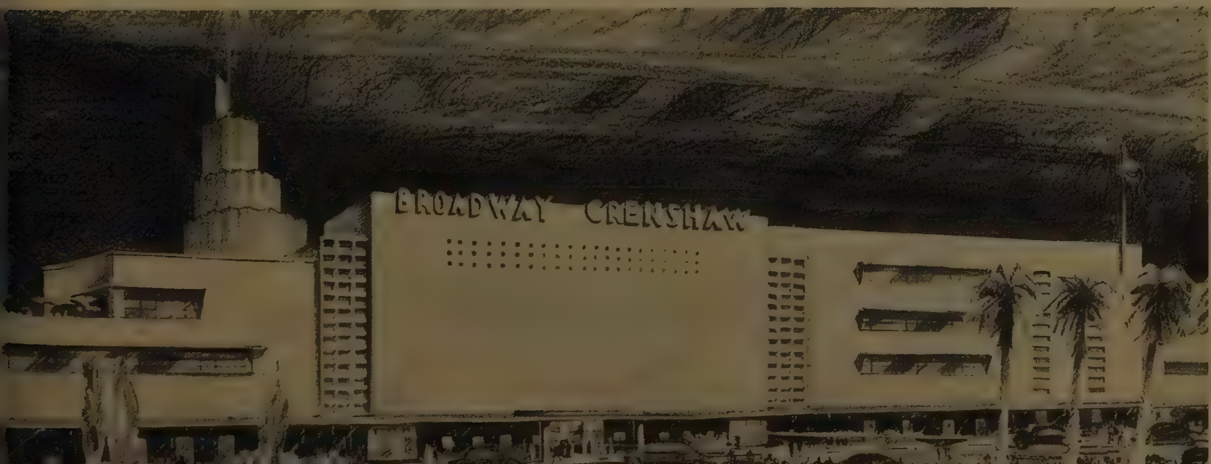
s Angeles, Calif.

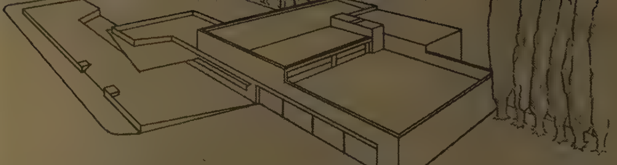
bert B. Gardner, architect

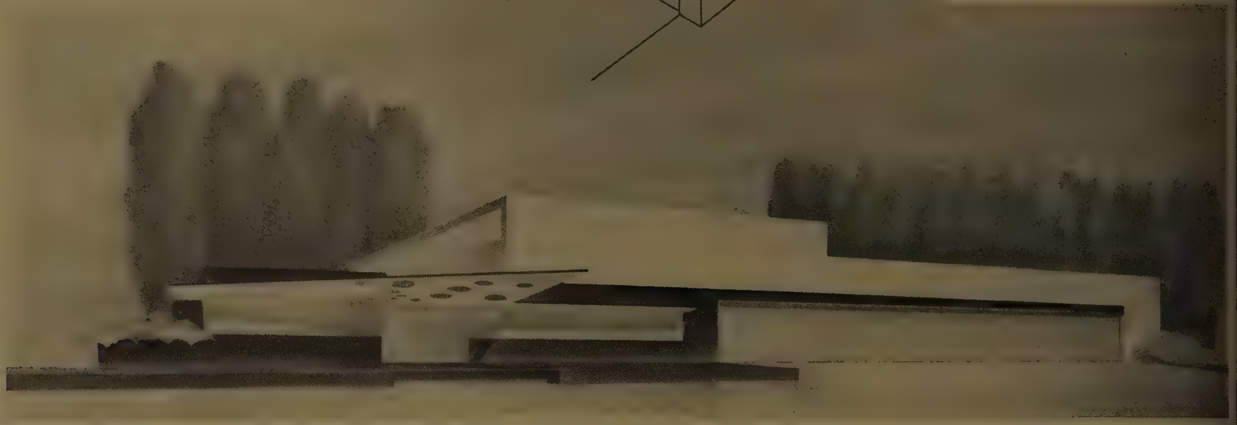
General view (below) shows the Broadway Department Store location in Crenshaw Blvd., flanked on either side by groups of proposed buildings. The main building (above) is located at the intersection. To the rear is a large parking lot with a proposed recreation center at distant left, a playground in center and a superservice station at right.

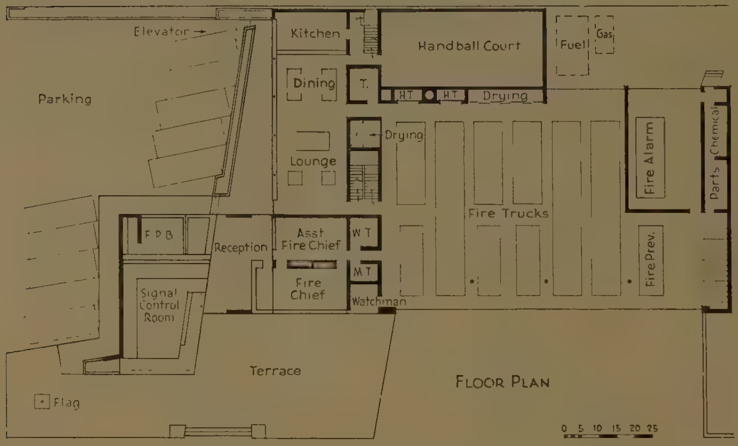


e rendering below is a view of the main building
m the parking lot, indicating that this structure is
have presentable appearance on all facades since
is really the heart of a merchandising community.
rge bands of windows provide daylight illumina-
n in sales areas, while solid concrete walls enclose
her areas where natural light is not wanted. This
velopment is one of the most ambitious commer-
al construction projects ever envisioned for the West
ast. It will be entirely architectural concrete.









FLOOR PLAN

CENTRAL FIRE STATION

Gary, Ind.

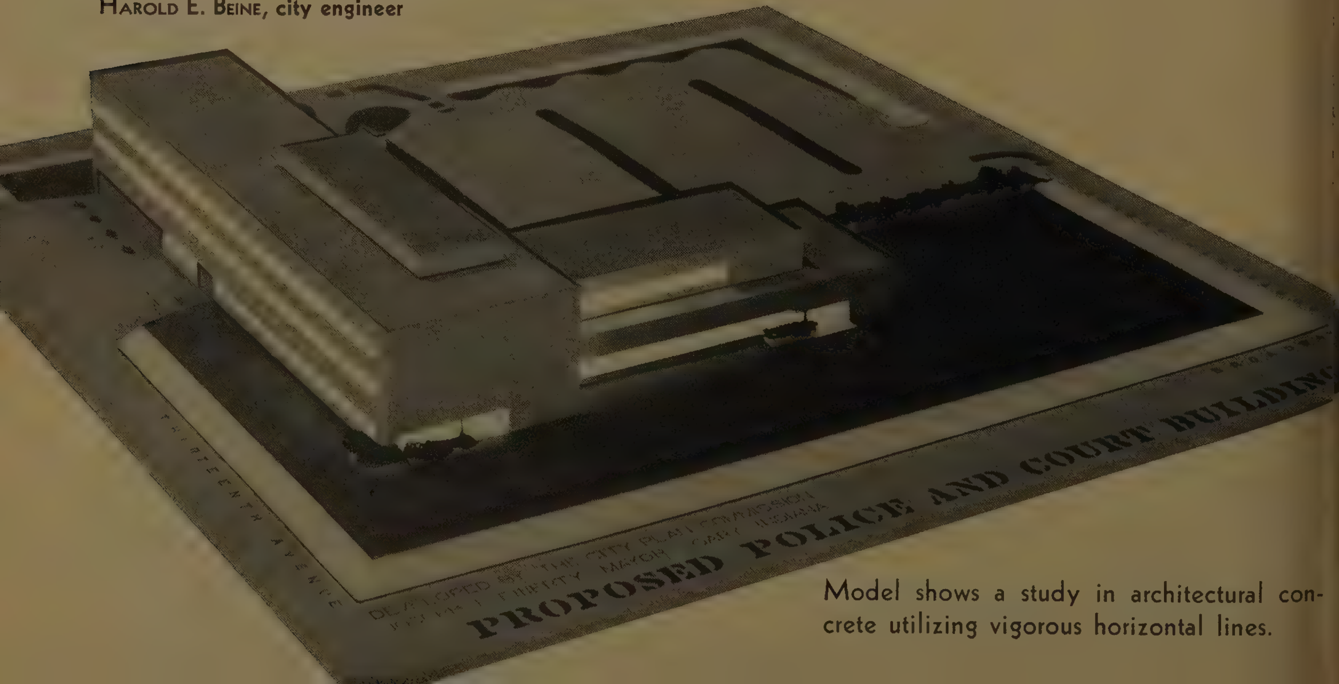
HAROLD E. BEINE, city engineer

More like a park pavilion than a hook and ladder house is Gary's new Central Fire Station, designed for architectural concrete and to be constructed as soon as possible. The plan is dominantly horizontal, confining most of the functions of the building, including some living and recreation areas, to one floor. Other new structures planned for Gary are the Police & Court Building (below), Fire Station No. 4, and a swimming pool and bathhouse not shown here.

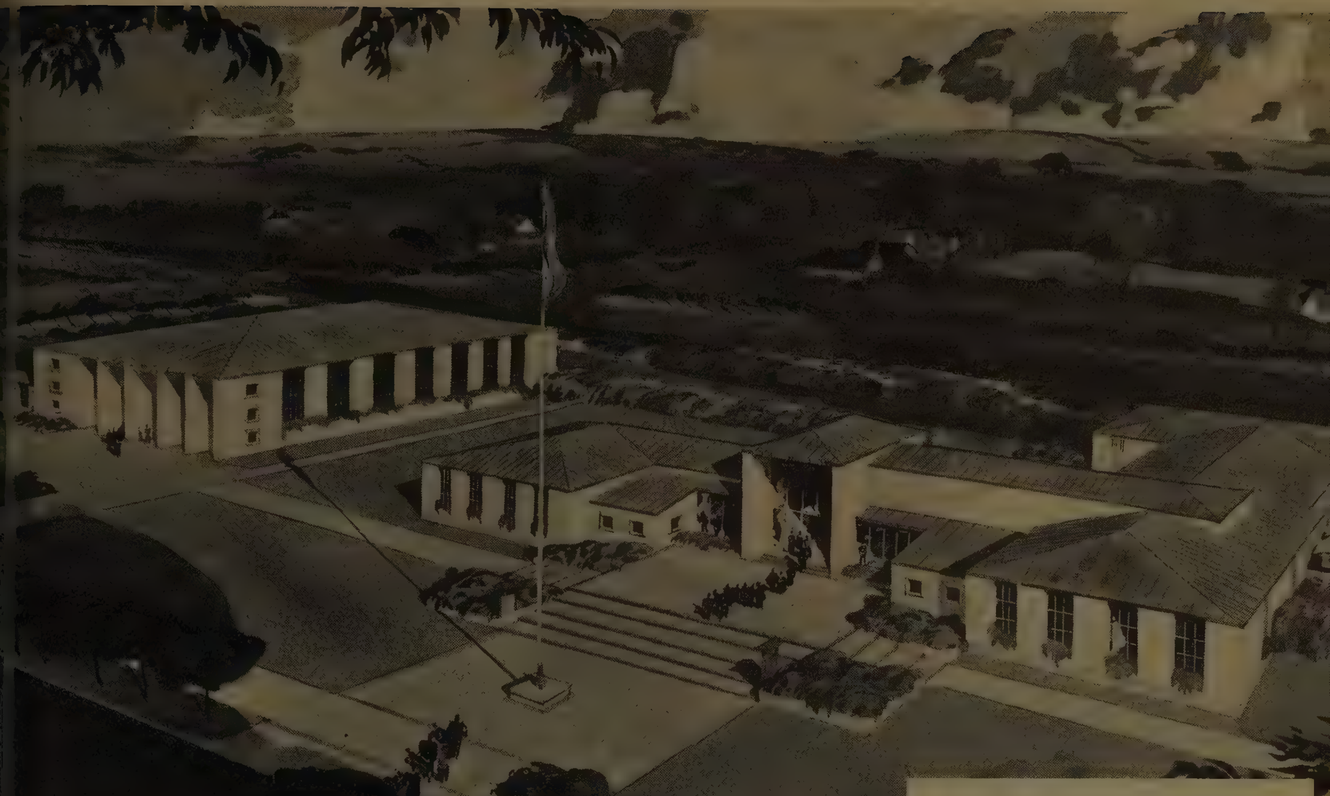
POLICE & COURT BUILDING

Gary, Ind.

HAROLD E. BEINE, city engineer


PROPOSED POLICE AND COURT BUILDING
THIRTEENTH AVENUE
BROADWAY
DEVELOPED BY THE CITY PLAN COMMISSION
MAYOR
GARY INDIANA

Model shows a study in architectural concrete utilizing vigorous horizontal lines.



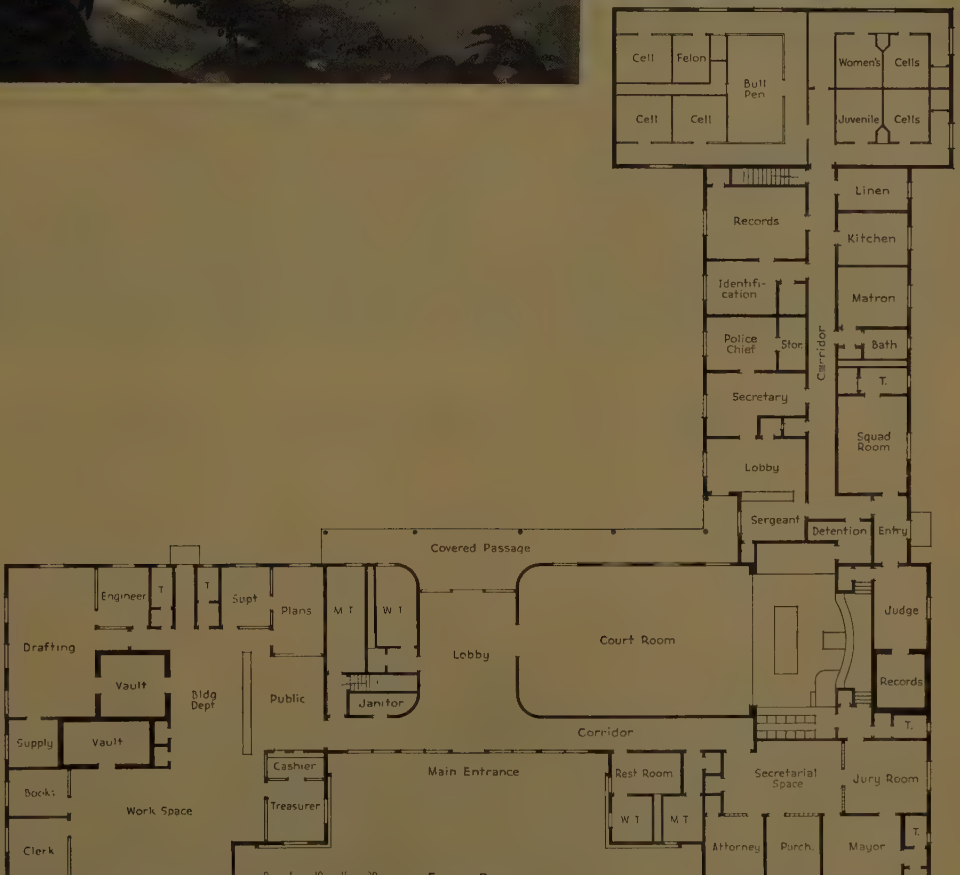
HALL

aula, Calif.

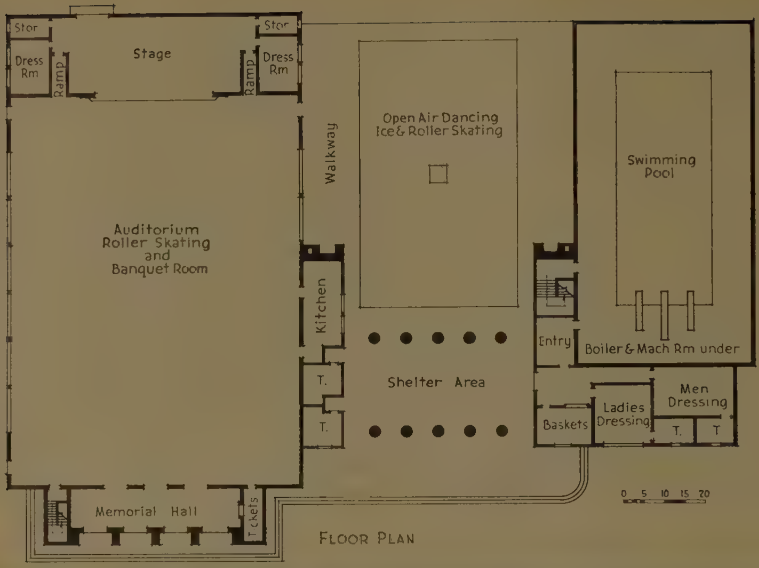
Allen and W. George Lutzi,

s

ad-out plan with low l roofs, the proposed aula City Hall follows anish influence, but in e the lines and details een modernized and vindow areas are pro- The auditorium at left planned in detail later) o be built of architec- oncrete. City hall will 00,000; the auditorium, 00.



Floor Plan



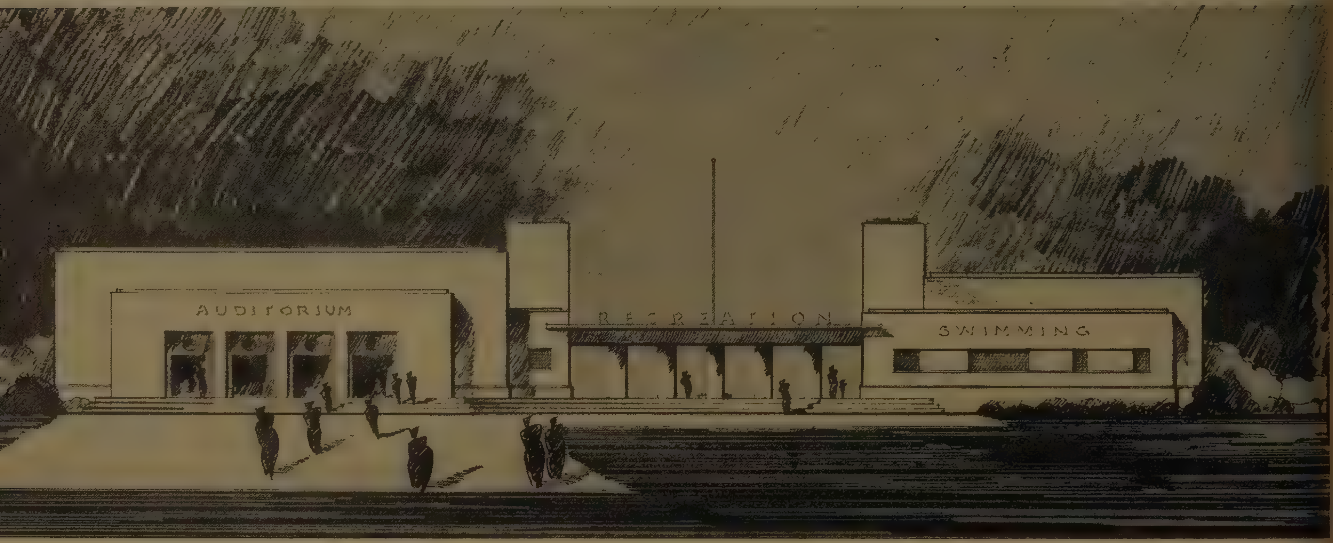
FLOOR PLAN

COMMUNITY BUILDING

Mt. Pulaski, Ill.

DEAL & DEAL, architects

The community building is really two structures—an auditorium and a swimming pool building—flanking an outdoor recreation area planned for dancing, ice and roller skating. The contemporary design will be executed in concrete.

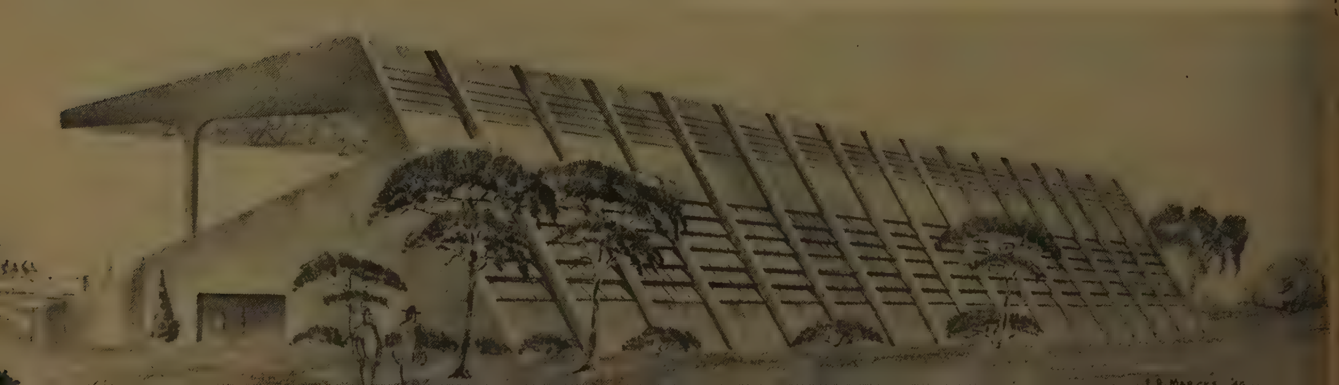


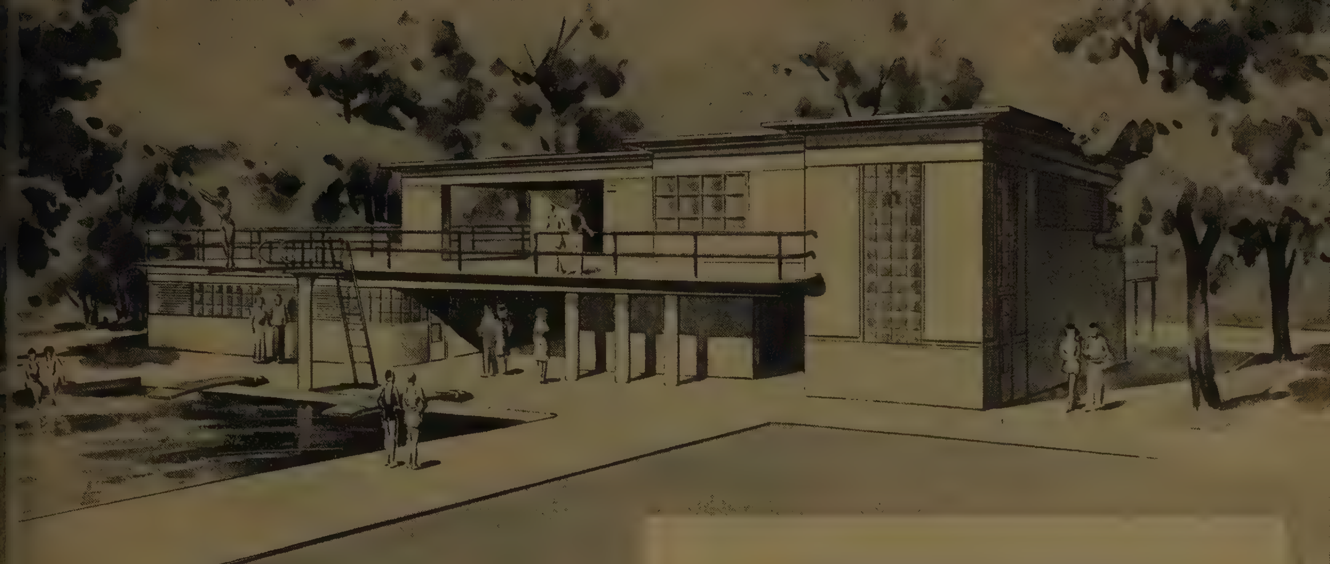
SOUTHERN MARYLAND AGRICULTURAL ASSOCIATION GRANDSTAND

Upper Marlboro, Md.

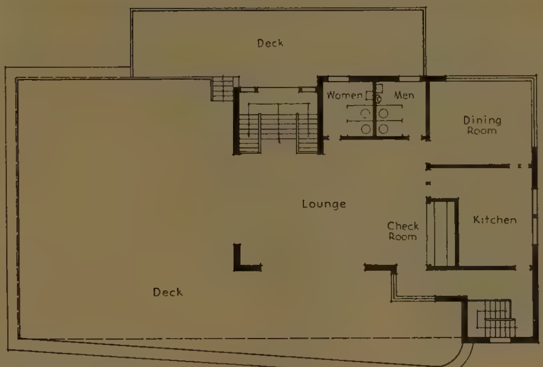
T. WORTH JAMISON, JR., & E. RUSSELL MARCKS, architects

This cleverly designed grandstand, with its inclined architectural concrete wall carrying the eye to the sweeping canopy roof, has seating capacity for 3,300 spectators and 105 betting windows for those who like the horses that way.

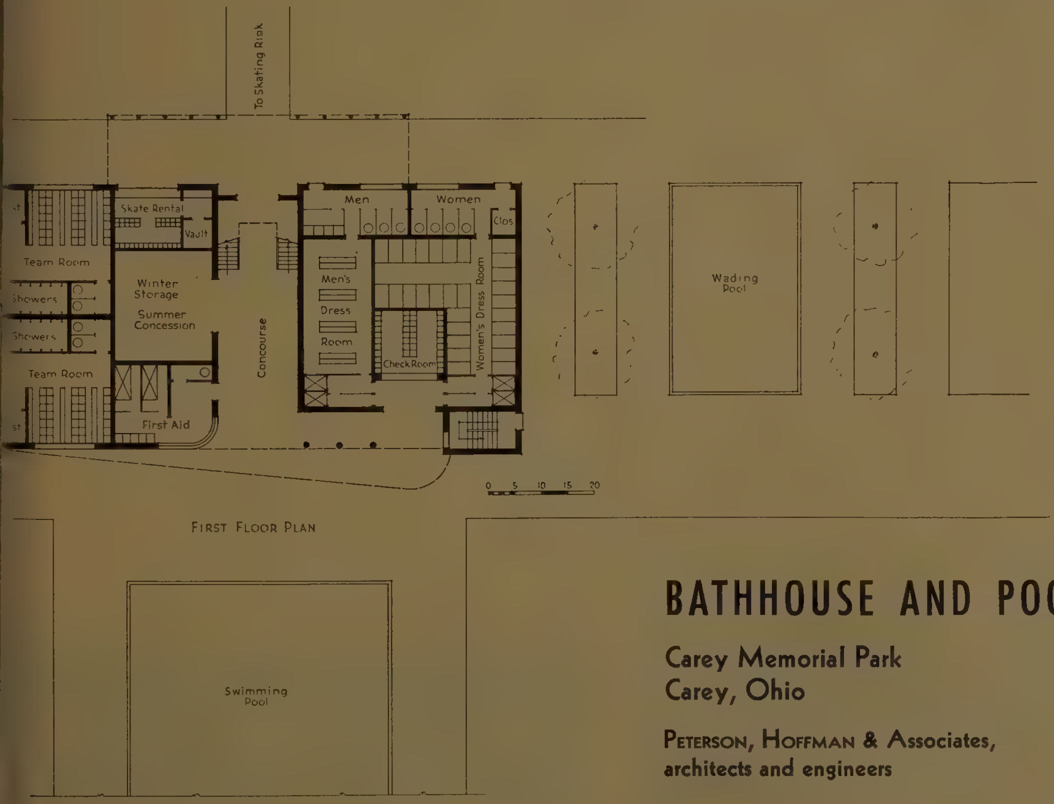




rchitectural concrete walls of the bathhouse are erced with large glass block light openings for good umination. A deck for spectators, with lounge and ning facilities, is on the second floor. At right of thhouse will be wading pools.



SECOND FLOOR PLAN

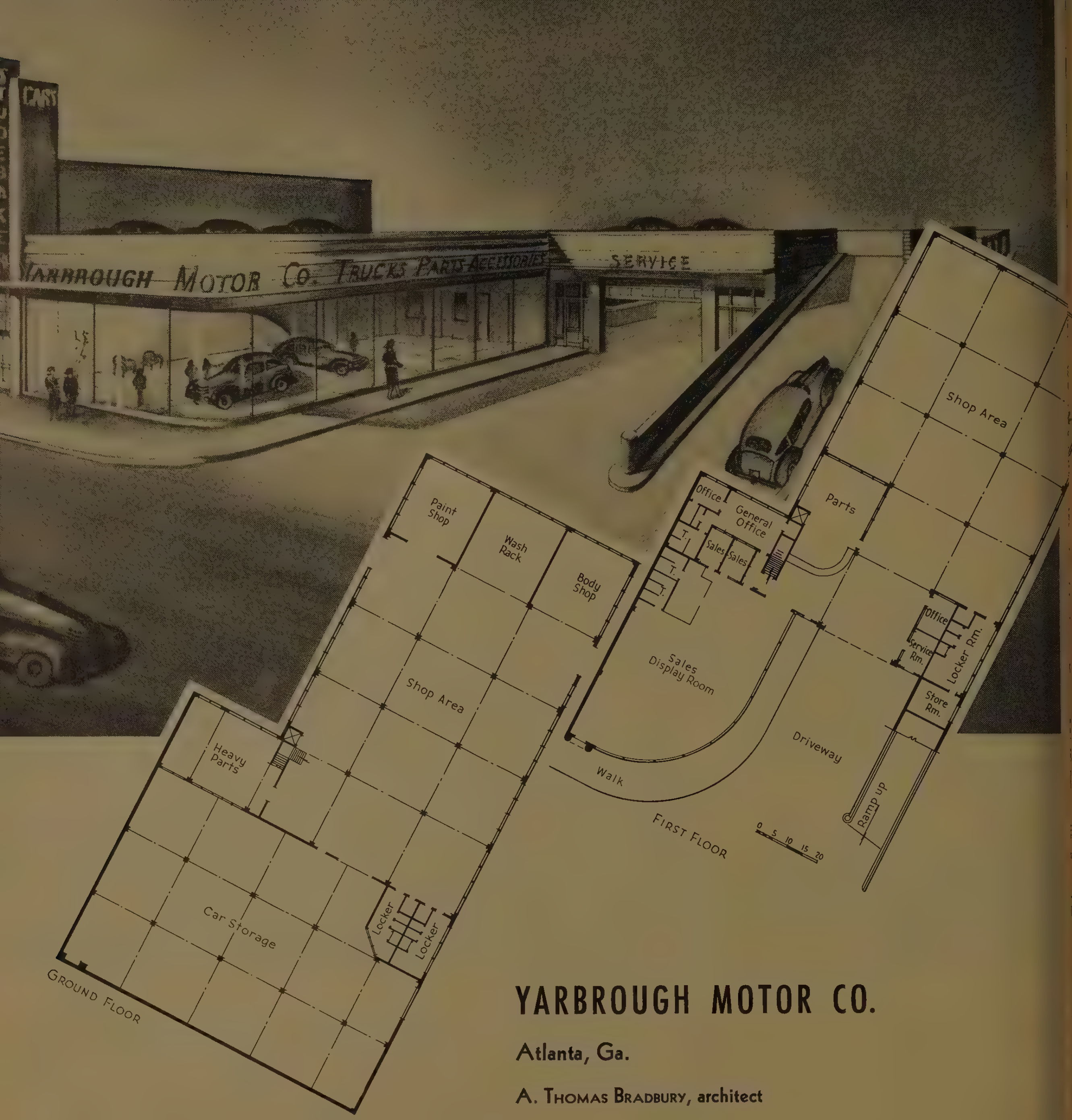


FIRST FLOOR PLAN

BATHHOUSE AND POOL

Carey Memorial Park
Carey, Ohio

PETERSON, HOFFMAN & ASSOCIATES,
architects and engineers

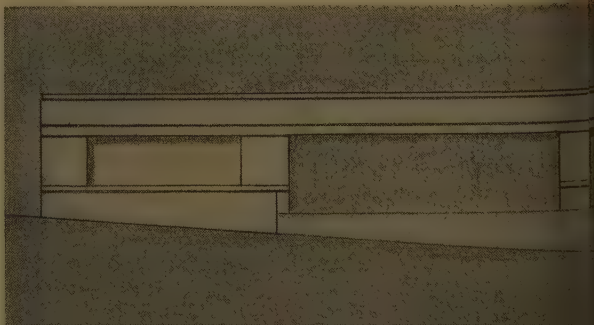


YARBROUGH MOTOR CO.

Atlanta, Ga.

A. THOMAS BRADBURY, architect

Now under construction in concrete is this combination sales, repair and storage garage. Concrete was selected for several reasons, according to the architect: firesafety, clean lines, abundance of light openings and as the logical material for ramp and exposed deck construction. Car storage is provided on the ground floor and transient parking on the roof. Total area provided is 28,000 sq.ft.

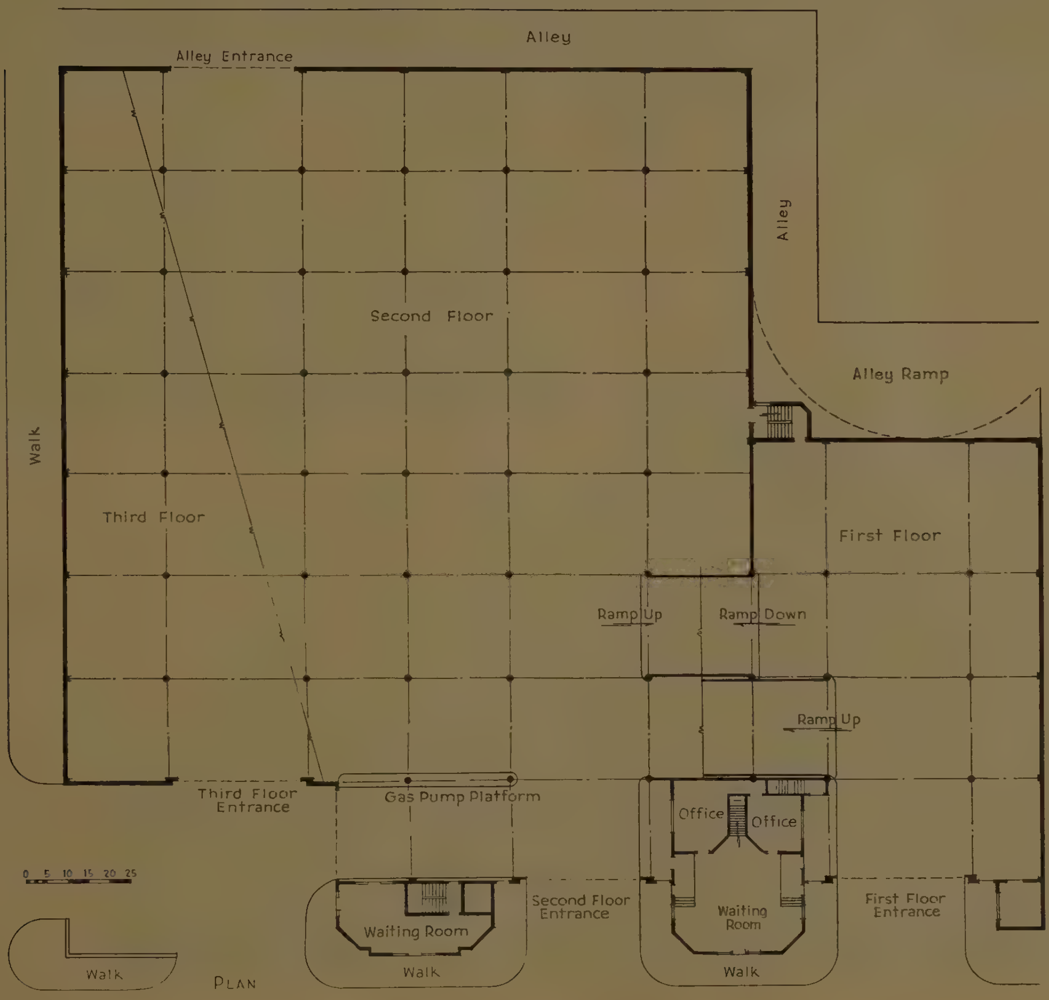


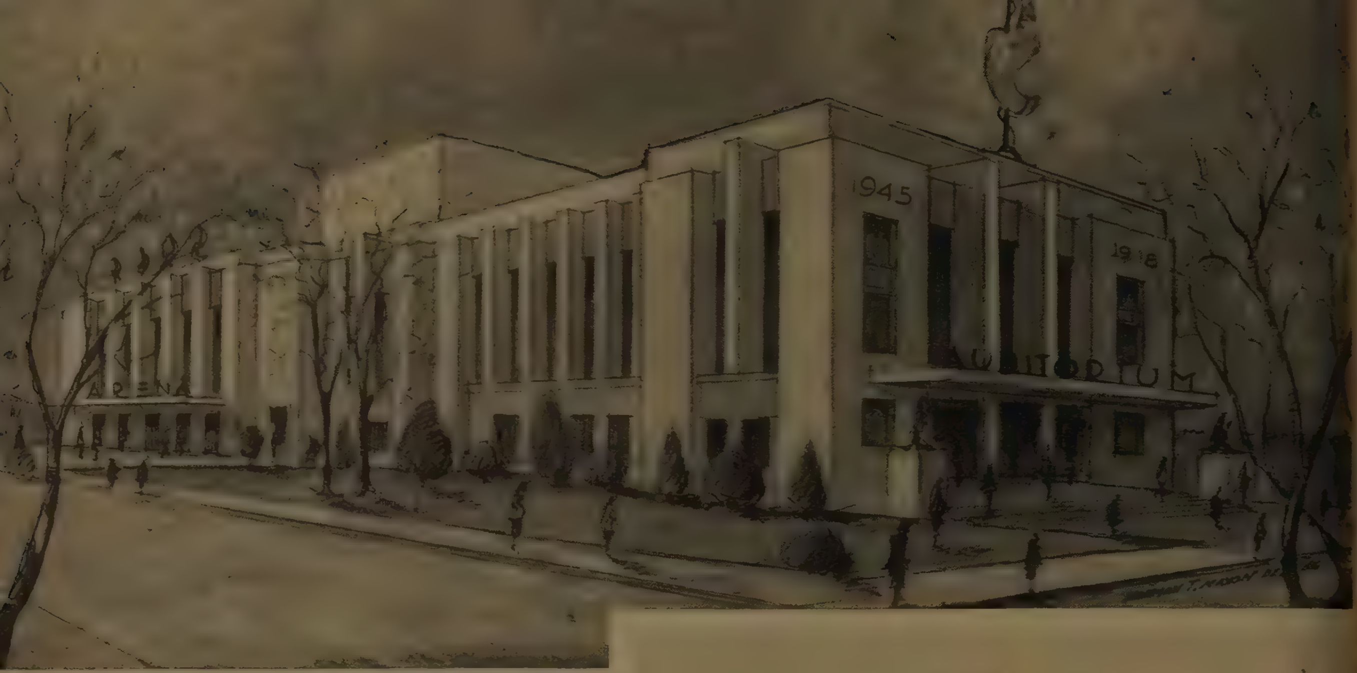
ARKING GARAGE — BOARD OF TRADE

nsas City, Mo.

ANK E. **TRASK**, architect
ARRY **NOBLE**, engineer

Designed ultimately for six parking levels, this new open-type parking garage will have four levels at first, and a capacity of 766 cars. Flat slab reinforced concrete construction with 24x33-ft. spans is used for the floor system, permitting three cars to each bay with adequate fender room. Complete garage service is provided on the main floor.

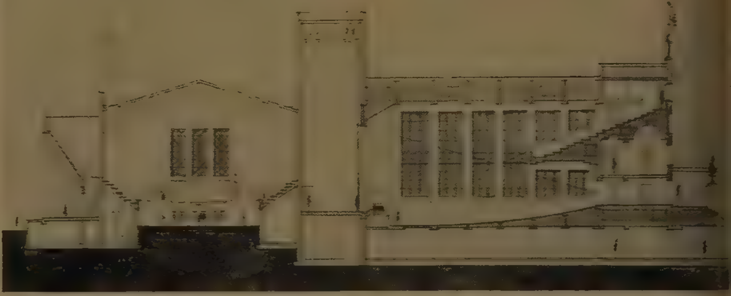


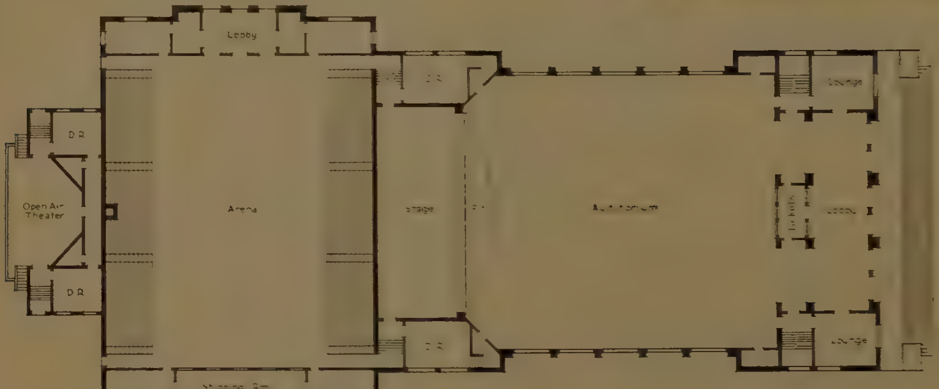


MEMORIAL AUDITORIUM AND CIVIC CENTER

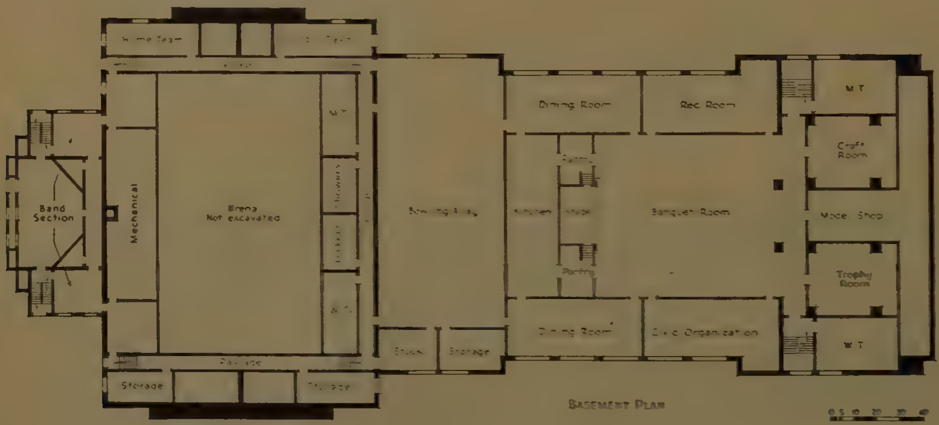
Elkhart, Ind.

Norman T. Maxon, architect





First Floor Plan



Basement Plan

Elkhart, the "band instrumer
capital of the world", was th
first city in America to plan
music building in memory c
its World War II heroes. C
the two plans submitted—
bandshell and an auditorium—
the latter was selected. It wi
cost about $500,000. On
end of the concrete structur
is a bandshell for open-air con
certs, and within the buildin
adjoining the auditorium is
large arena with ample sea
banks for spectators. Spac
throughout the building pro
vides for various kinds of recre
ation and community gathe
ings. Designed throughout fo
architectural concrete, the ex
terior is given a strong vertica
feeling by the many pylor
which extend up to the parape

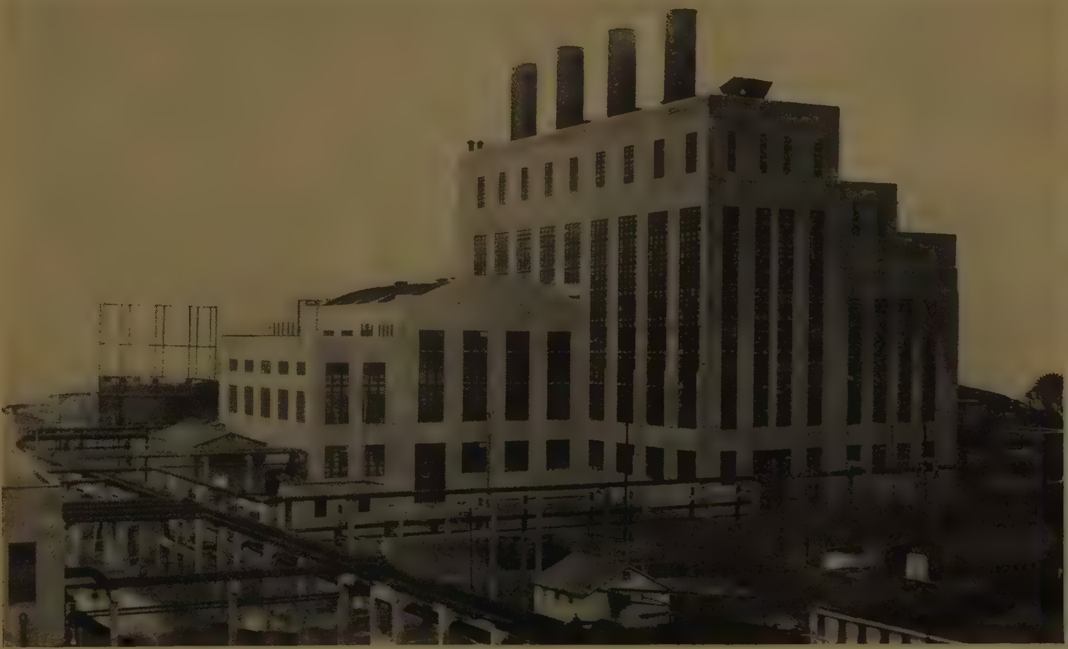
oppers Power Plant eveloped in unctional design

By Boris Lochak*

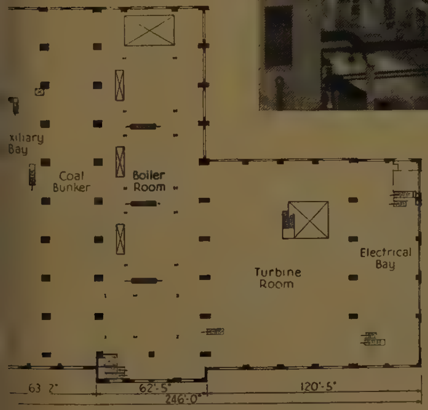
AN such a purely utilitarian structure as a power plant
be made pleasing in appearance without resort to
guise and without unwarranted expenditure? The power
nt in the butadiene plant, operated by Butadiene Divi-
n of Koppers Co., Inc., agent for the Reconstruction
ance Corp., Office of Rubber Reserve, at Kobuta, Pa.,
uld seem to show that it can.

There is no incon-
ency between the
ign and the pur-
es of this plant;
re are no unneces-
y "trimmings". It is
imple, functional
ign built with econ-
y but is pleasing to
eye and befits the
roundings. Rein-
ced concrete was
cted for the exte-
and for nearly all
he framing for this
ucture, and while availability of the materials played an important part in its selection, the great adaptability of reinforced concrete to a variety of form and structural design was a determining factor. Built during the war and therefore not permitted to be described before, the plant supplied steam and electric power for the various processes in the Koppers butadiene plant, a major unit in the rubber program carried out by the Defense Plant Corp. The plant contains four boilers having an hourly steam output capacity of 350,000 lb. each and has one 35,000-kw. back-pressure turbogenerating unit.

The engineer's conception of a large power plant is an assembly of many mechanical parts, each positioned for most efficient operation of that part and of the assembly as a whole. Under this conception, other considerations, such as architectural, must be subordinated to the mechanical requirements. But the steam locomotive, the airplane and other assemblies of essentially mechanical equipment, of which today's examples are far more complicated than the earlier ones, have been greatly improved in appearance.



The Koppers Co. power plant serving its butadiene plant in Kobuta, Pa., was designed and built by Gibbs & Hill, Inc., New York, N.Y. It expresses the relative sizes of the equipment and facilities constituting the mechanical assembly.



Plan of Operating Floor

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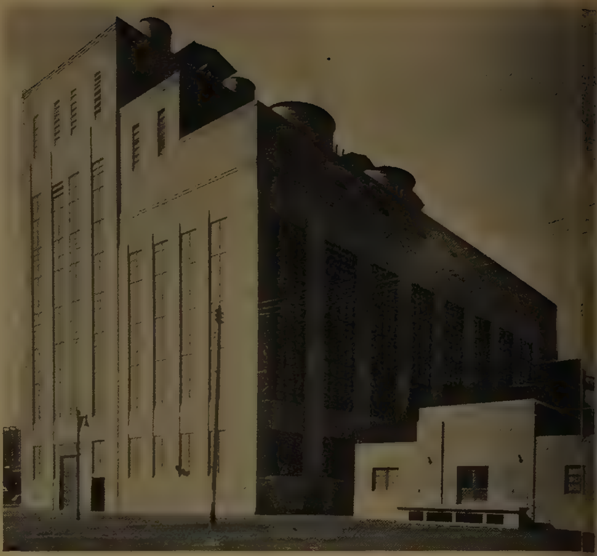
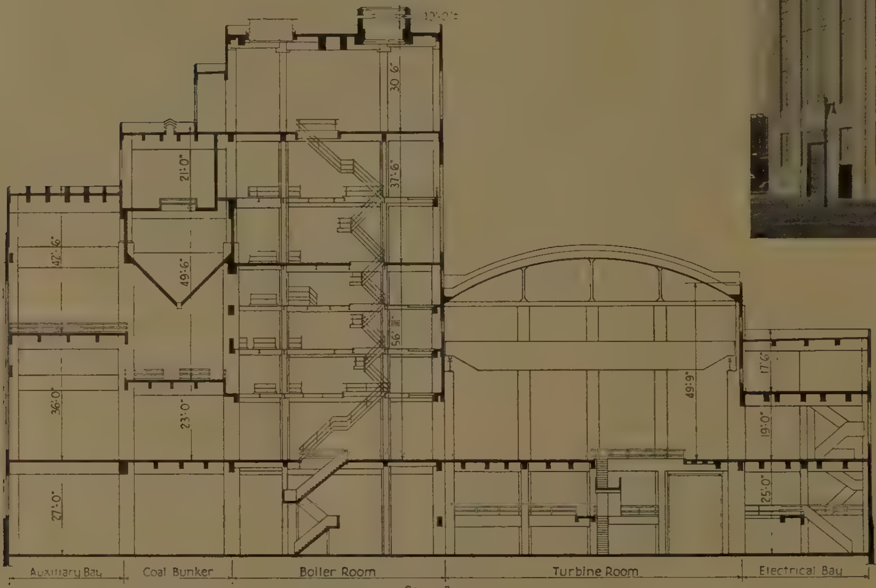
*Structural engineer, Gibbs & Hill, Inc., engineers-constructors, New York, N.Y.

These improvements have been achieved through constant thought and coordination of effort applied for a common purpose, that is, more power with less weight, greater efficiency and higher speeds, all of which has resulted in more streamlined shapes. As the streamlining constitutes the architecture of the locomotive, so the expression of the relative proportions and sizes of the equipment should be the basis for the architecture of the power plant.



Spandrel beams are offset toward the inside an clear the windows. They are not visible fron the outside of the building and do not alter th overall vertical effect of the tall windows an pilastered walls. The wood window frames wer made as light as possible by bracing them agains the inside spandrels and they were painted dar green to make the horizontal mullions inconspicuous so even they would not detract from th verticality of the design.



CROSS SECTION

There is a misconception in many minds about the relation of architecture to embellishment and ornamentation. Architecture is basically a matter of rational planning and the sincere expression of that planning in the completed structure. Embellishment and ornamentation are too often used only as a means of camouflaging inadequate planning or as deceptive coverings for poor design. An example of a structure having rational functional design and well nigh perfect proportions is the George Washington Bridge. Such a structure does not need embellishment but unfortunately some others do.

In designing the Koppers power plant an earnest endeavor was made to follow this concept of good architecture. The design is pre-eminently vertical and could hardly be sincere if conceived differently in view of the fact that the main part of the building—the boiler bay which is 150 ft. high—is practically one single room, divided horizontally only by a few steel platforms. Also essentially vertical are the bunker and heater bays which involve such floor or story heights as 33 ft. and 42 ft. Emphasizing this verticality are the pilasters and the vertical windows running the full height of the building. The base course was made 10 ft. high to be in proportion t the structure. Above the boiler room there is a conveyo and fan room and here a horizontal run of narrower windows, centered over the larger openings below, was provided. In the turbine room a clear space 85 ft. in widtl and of considerable height was necessary. An arch-roofe structure was the logical answer. The electrical bay alongside the turbine room has an intermediate floor and th fenestration was handled accordingly but in harmony wit the rest of the building.

The selection of concrete for the outside wall materia followed naturally with the coordinated structural an architectural designs. Unit masonry was hardly desirabl from the point of view of appearance, and also for structural reasons because of the considerable number of spandrel beams which would be required to carry the wall load at the various levels and which would require practicall as much falsework as the construction of concrete walls Moreover if the spandrel beams were left exposed the would interfere with the verticality of the design. Consequently it was decided to use concrete for the walls and t construct them integrally with the columns. The walls ar upported for their full height and carry their own load n to the foundation. Spandrel beams for longitudinal ning purposes are offset toward the inside and clear the dows. They are not visible from the outside of the lding and do not alter the over-all vertical effect of the stered walls. In addition to the purely structural fram- purposes, the spandrel beams also brace the compar- ely light wooden window mullions. All window frames of wood construction, for metal frames were not avail- e, but all sections of the window members were reduced minimum by careful selection of bracing points on the de concrete spandrels. An additional lightening effect obtained by using dark green paint on the frames.

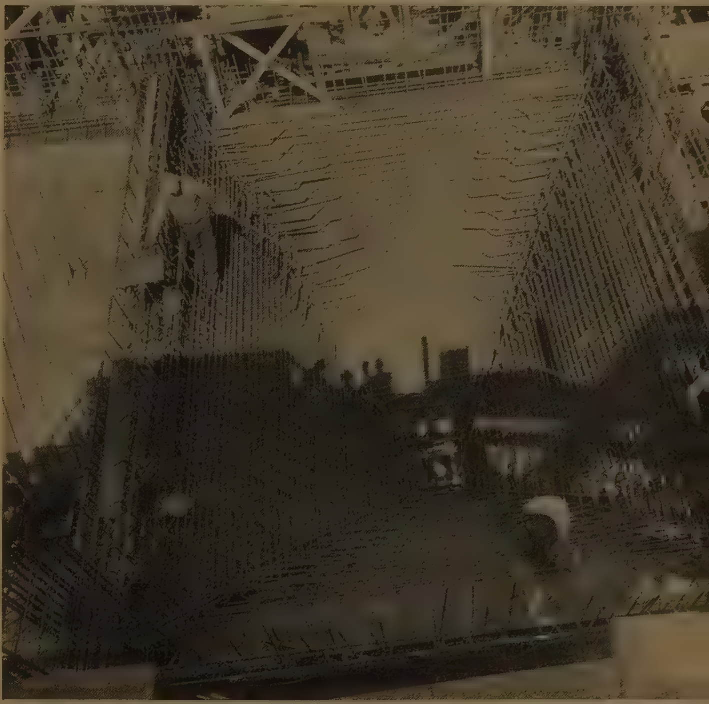
he architectural arrangement inside the building was erned strictly by the basic layout of the plant, but con- erable care was given in the structural design to proper portioning of structural members, stairways and other erior appurtenances. Concrete column sizes were reduced he minimum by taking full advantage of higher stresses wed in members subjected to combined compression l bending, and every column section was so propor- ned in relation to floor heights and so oriented as to e the lightest effect in appearance. In designing the stair- ys, most of which are reinforced concrete, particular ention was given to provide the maximum floor space reducing supports to a minimum. They are usually sup- ted by a single light stub column.

As shown in the accompanying illustrations the building sists of two adjoining structures, dissimilar in size and pe. The main structure incorporates the boiler room, l bunkers and auxiliaries and is 216 ft. by 125 ft. 7 in. plan and 151 ft. in height from ground level to the rapet. Stacks extend another 50 ft. above the boiler room f. This main structure is composed of three sections, the ler bay which is 58 ft. 9 in. wide and 150 ft. high, the nker bay which is 30 ft. wide and 125 ft. high and the ater bay which is 33 ft. wide and 105 ft. high. The boilers centered in the middle of the boiler bay and are sup- ted on structural steel boiler columns spaced 28 ft. 9 in. 30 ft. 6 in. These columns extend to the fan floor. To oid undesirable cross-bracing around the boilers, these umns had to be backed up by the concrete building. e long west wall of the boiler room has no floors framing o it for a height of 93 ft. 6 in. and it is not backed up any other part of the building except where it abuts the bine room and it was therefore necessary to tie this wall nsversely into the rigid bunker and auxiliary bays. This s done by means of steel platforms around the boilers d by designing the top of the building, that is, the fan or and roof, as a rigid frame. This heavy upper structure upported vertically on the steel boiler structure and the outside walls but the lateral loads are absorbed by the rigid frame. The lateral loads are the stabilizing loads for the boiler structure, the wind pressure on the building and stacks as well as the lateral thrust of the crane in the turbine room.

The bunker and auxiliary bays are of interest because of the floor heights and floor loads. The first floor is 27 ft. above grade as in the rest of the building and is designed

Foundations consisted of individual square or rectangular spread footings and two continuous footings. Separate footings were provided for some of the heavy equipment.

Reinforcement in place for a coal hopper. Each hopper was designed as a rigid pyramidal suspended box.



for 400-lb. live load. The second floor is 23 ft. above the first and, while carrying only the light load of the scales, was designed for 300-lb. live load to allow for the bunker loads during construction. The next cross-framing is the bunker girder 33 ft. above the second floor. The conveyor floor is designed for 200-lb. live load. The roof is an extension of the fan room floor and ties these two sections rigidly together.

Adjoining the main structure is the turbine room composed of two bays, the turbine bay which is 85 ft. wide and the electrical bay which is 36 ft. wide. Intermediate columns in the latter divide it into two 18-ft. spans under the switchgear floor which was designed for a live load of 600 lb. The operating floor of the turbine bay was designed for 400-lb. live load and is supported on three lines of intermediate columns. Above the operating floor the turbine room is spanned by a concrete tied arch roof designed for a live load of 40 lb. A 100-ton traveling crane spans this floor and is operated over steel girders supported on offsets in the concrete columns.

The subgrade is composed of coarse gravel for which a maximum design pressure of 6,000 p.s.f. was used. The loads of the structure are carried on columns, except that the outside walls carry their own loads down to the foundations. Generally the foundations are isolated square or rectangular footings with two-way steel reinforcement in the bottom. Continuous footings with top and bottom reinforcement were provided under the columns carrying the coal bunkers. Equipment foundations are generally isolated from the building foundations, especially the foundations for high-speed equipment such as the turbine and boiler feed pumps. Heavy low-speed equipment such as the coal mills is founded integrally with the building foundations. Footings vary in thickness from 2 ft. 6 in. to 6 ft. 0 in. and are set at an elevation 10 ft. below grade, leaving a minimum clearance of 4 ft. for the trenches, conduits, drains and other underground connections.

The 10-ft. high base course of the outside walls is 18 to 27 in. thick and extends to 2 ft. 6 in. below grade, without spread footings, but the wall loads are carried to the footings of the outside columns. This arrangement avoided interference with the many pipe lines and conduits leading into the building. It also speeded up construction by permitting the release of the foundation drawings to the field before the piping drawings had even been started.

The design of the structure was based on the use of concrete having an ultimate strength of 3,000 p.s.i. at 28 days. The maximum fiber stress used in the design was 1,350 p.s.i. in the concrete and 20,000 p.s.i. in the reinforcing steel.

The building frame was analyzed throughout by moment distribution for both vertical and lateral loads. All columns were designed for bending and direct stress for which th highest design stress permitted under the American Concrete Institute Code was used. This design stress varie depending upon the percentage of reinforcement, the rati of the bending moment to the direct load and the size the member, but in all cases it was much higher than th allowable direct compressive stress. The bending momen in some columns was as high as 1,200 to 1,400 ft.kips an the direct load was 1,500 to 1,800 kips.

The most involved floor designs are the fan floor and th roof over the boiler room. The fan floor supports the heav fans, each weighing approximately 45 tons with a 15,500 lb. rotor revolving at 1,100 r.p.m. The supporting concret girders, spanning approximately 30 ft., are 48 in. deep an rest on the boiler columns. These girders and other structural members of this floor were designed for a natur period of vibration well above the period of the rotor t avoid resonant vibration. Apparently the results are satisfactory for there has been no noticeable vibration with th equipment in operation. No absorbing material was use and the freedom from vibration was obtained only by mean of the framing design. For damping purposes the slab thickness immediately under the fan casing was increased t 18 in.

The roof framing is of most unusual design with diagona members to assure sufficient lateral rigidity of the uppe part of the structure. The framing was designed to carr brick stacks which would have weighed 160 tons each After the roof had been completed, steel plate was mor readily available and the stacks were constructed of stee

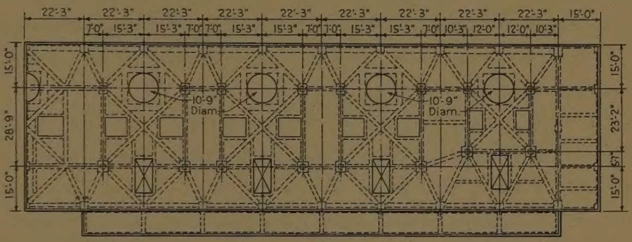
Interior of coal bunker bay showing reinforced concrete pyramidal pers and structural framing between bunker bay and boiler room.

The reinforced concrete coal bunker has nine hoppers, h in the shape of an inverted pyramid, 19 ft. high and ving an opening 2 ft. 3 in. square at the bottom, the lls fanning out to a 30-ft. 0-in. by 22-ft. 3-in. rectangle the top. These walls are solid slabs 9 in. thick at the ttom and 12 in. thick at the top. There are no stiffeners supporting beams, each hopper being designed as a rigid ramidal suspended box. The bunker extends some 12 ft. ove the tops of hoppers as a continuous unit without nsverse walls. The capacity of each hopper is 280 tons coal.

The turbine room roof is a parabolic tied concrete arch ving inverted ribs. The ribs are 22 ft. 3 in. o.c. and the ll is 4 in. thick with no longitudinal beams. The shell s designed as a stiffened parabolic arch in which bending is developed only under nonsymmetrical loading such full snow load on one side of the roof. The ribs are conuous with the building frame and are designed for varis loading conditions, as well as for temperature variations. e ties, which are 84 ft. long, were made as slender as ssible. The dead load of each tie is carried by three conte hangers supported by the rib. The ties are reinforced th sixteen $1\frac{1}{4}$-in. bars and were designed to absorb the l arch thrust under the maximum loading condition.

ine room has 85-ft. wide floor space spanned by a concrete shell tiffened by inverted tied arch ribs. The concrete floor is scored quares and is colored by incorporation of pigment in the topping.

Actual construction was started almost simultaneously th the design. Three weeks after the preliminary general arrangement was set, the foundation drawings were released. The entire area under the building was excavated to a depth of 10 ft. After completion of the building foundations the area was backfilled with gravel and rolled, and the foundations for equipment were erected at various depths. The whole ground floor is covered with a 12-in. thick concrete slab reinforced top and bottom. Over this base slab is a 4-in. thick finish reinforced with wire mesh. The operating floor required rather extensive falsework because of the unusual floor heights.



BOILER ROOM - ROOF FRAMING PLAN

The turbine room arch was built on full-height, regular falsework, as the size of this roof did not warrant a traveling truss form. The outside forms for the coal bunker were supported on the scales floor, without support underneath, in order to leave the operating floor free for erection of equipment. The inner forms were suspended from a system of overhead wooden trusses supported on concrete stub columns.

As work progressed it became obvious that the bunker bays would reach the conveyor floor level at about the time the first boiler would be ready for operation, but about 8 weeks before the fan floor could be completed and the fan necessary for operation of the boiler could be installed. In order to save time the formwork for the entire fan floor area over the boiler room was supported on the steel framework of the boilers, the middle portion on shores on the steel construction, the 15-ft. wide panels on each side on a system of wood cantilevered trusses. When the bunker bay construction reached the level of the fan floor, this floor was ready for placing of concrete and many weeks were saved. The fans were installed a few days after the concrete had been placed and the shoring for the roof construction was spotted around the equipment so that there was no interference with operation of the plant. Fifteen months after beginning the design, the construction was complete and the four boilers and other equipment were in full operation. The structure required some 19,000 cu.yd. of concrete and 1,700 tons of reinforcing steel.

Eustis, Florida Gets a New School

By Richard B. Rogers, Architect*

The city of Eustis, situated on beautiful Lake Eustis in the heart of central Florida's rich resort area, was faced with the necessity of erecting a new school building. The board of trustees of School District No. 10 had condemned the two-story brick, tile and frame school built in 1925 as unsafe for occupancy.

The board had known for some time that this action would be necessary and consequently had started to develop plans for a new building. So, when the board members retained the writer to design a school, their ideas concerning the basic construction had pretty well crystallized. They desired a building that would be highly resistant to fire and hurricane as well as large enough to accommodate any increase in enrollment which might occur within the foreseeable future and to do so at reasonable cost. As a result of subsequent conferences, it was determined that an architectural concrete school would best meet the requirements of the community as outlined by the board.

Work proceeded as soon as plans could be prepared, with federal funds augmenting the bond issue money which the citizens of the school district had voted enthusiastically at an earlier date. In razing the old building, workmen were cautioned to salvage all material possible for use in the new construction. This consisted mostly of lumber, which could be converted readily into forming, thereby minimizing the use of critical material.

The design is simple and purely functional; only a minimum of ornamentation was used and it was confined mainly to the entrances and the parapet. The grain of the wood used for forming shows in the finished walls, giving a very pleasing effect, and it emphasizes slightly the horizontality of the design. An application of portland cement paint does not obscure the form marks.

Shaped like a letter E, the wings of the building are separated from the main portion by expansion joints. Control joints are located at the centers of all openings to relieve stresses due to volume change.

One end wing is devoted entirely to classrooms, including science and commercial laboratories and storage space. In

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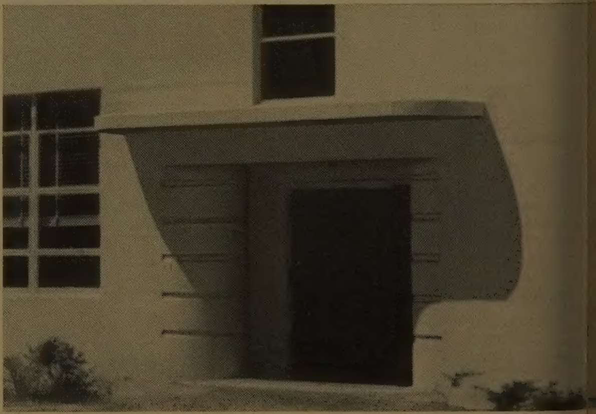
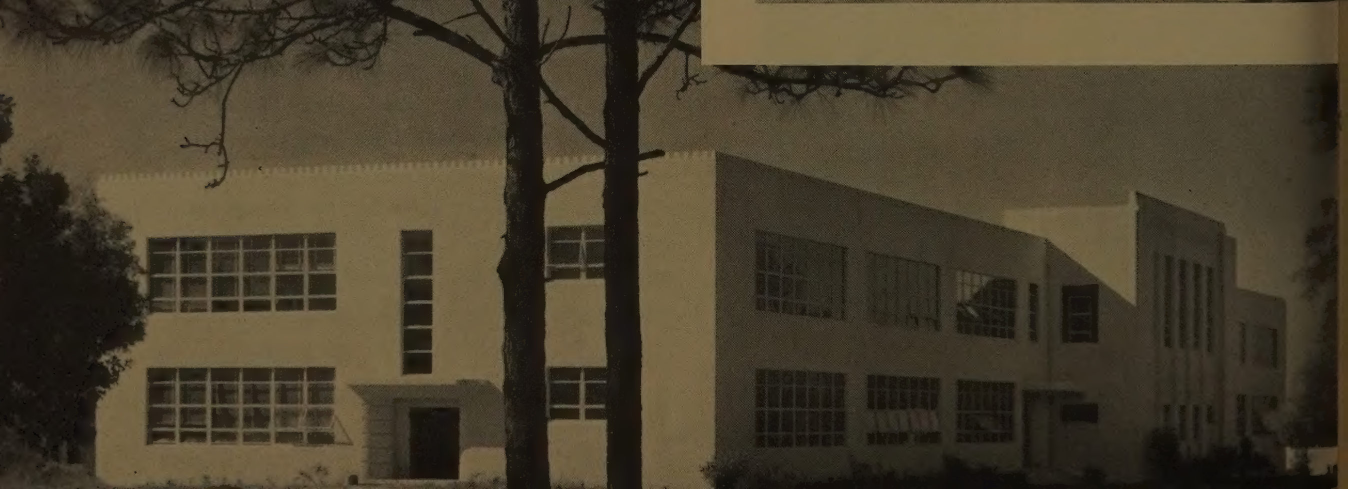
*Orlando, Fla.





This fine two-story concrete school at Eustis, Fla., in the heart of the state's rich resort area, replaces a building that was erected in 1925 but recently was condemned as unsafe. Interesting fact is that boards salvaged from the old structure, useless for any other purpose, were good for concrete forms. At right is close-up of end of building showing formboard marks and neat curved reveals at doorway under cantilevered canopy.

other end wing the natural slope of the site made sible additional space at grade level for the manual ining and printing shops, the cafeteria and boys' ker and shower rooms. Classrooms are located in two floors above. The center wing contains the ditorium, boiler room and girls' locker and shower oms, while in the main part are the general offices d classrooms on the first floor and the library and ditional classrooms on the second floor.

Tall windows in the library insure good natural hting all the way across the relatively wide room. re the exposed concrete beams in the ceiling have span of 32 ft. Eventually they are to be given a nciled decorative treatment in colors which will atly enhance the appearance of the room.

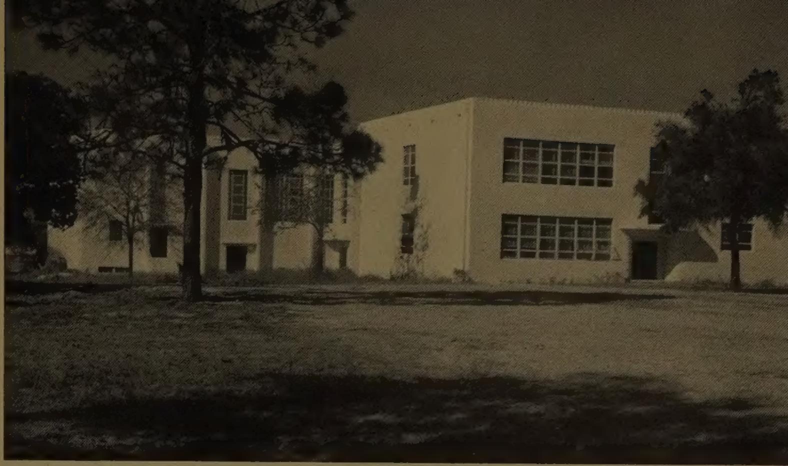
Walls and ceilings in all other rooms and in the rridors are furred and plastered. A sand-finish plas- was used. To date only a few rooms have been inted in pastel shades, but as funds are available ery room will be painted.

It was realized that regardless of the type of con- uction, no matter how carefully plans and details drawn and specifications are written, without good rkmanship the efforts of the architect to secure a gh-quality job will be nullified. Construction was cordingly given the closest possible supervision with result that a highly satisfactory job was obtained. e forms were carefully erected, reinforcement was ll placed and tied securely to be sure that no metal uld be closer to the surface than 2 in. Concrete de with not more than 6½ gal. of water per sack cement was specified to have not more than 4-in. mp and all concrete was vibrated and carefully rked against the forms.

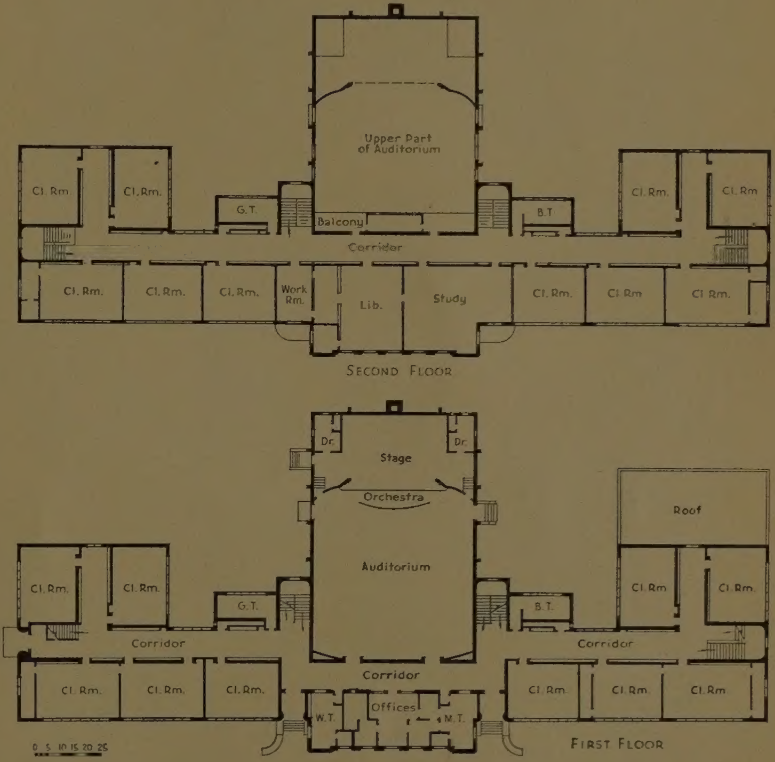
Everyone connected with the job felt well repaid the care and thought given to it. The school board o well pleased that representatives of any commu- y who may be gathering information on school nning and construction are welcome to inspect new building.

Designed to accommodate 600 students, although present enrollment is considerably less, the com- ted building, exclusive of equipment, cost approx- ately $300,000.

The board of trustees during the planning and ly construction period consisted of B. M. Kinser, esident, Mrs. Virginia Dean and C. Harold Hippler. the time of completion, the membership consisted Mr. Hippler, president, L. L. Polk and Percy E. wkins. Work was done under the direction of arion Goggans of Orlando.



Side view of Eustis School which is an E-shaped building. The center wing (left in photo) houses the auditorium.



Library of Eustis School, a spacious room with high windows, has exposed concrete walls and exposed roof beams finished with white portland cement paint.

ARCHITECTURAL CONCRETE

This is the first of a series of illustrations by Hugh Ferriss demonstrating adaptability of Architectural Concrete for apartment buildings—hospita schools. Architectural Concrete combines architectural and structural functio one economical, fire-resistant material. Watch for future illustrations and det

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